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Exploring Alternative Revenue Structures for WPI Health Services

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Abstract

WPI Health Services has been consistently providing quality care to students. Presently, they are relying on student health fees as their primary source of revenue. However, in order to improve the quality of care that WPI Health Services provides, additional options should be explored. Our project entails investigating and analyzing the remuneration of the business plans currently implemented by other colleges, as well as examining the three primary revenue-producing health structure options. The three revenue structure options are third party billing, student health fees, and fees for service. In order to evaluate the practices of other schools and conduct scenario and break-even analyses on the alternative plans for WPI Health Services, we conducted interviews with the Directors of Health Services at some selected colleges, asking them questions about their operations, staffing, and satisfaction, and also investigate how each college's billing structure benefits their organization.

An additional aspect of our project that we carefully chose to include is a survey distributed to the students of Worcester Polytechnic Institute inquiring about their experiences with WPI Health Services. An overwhelming response of 731 students (representing approximately 20% of undergraduates) demonstrates the desire to better the quality of care at WPI Health Services. We use this data in order to get a better understanding of their opinions and to see where they would like money allocated within WPI Health Services.

According to our research and analysis, we find that the best option for WPI Health Services is to increase the percentage of funds that they receive from the current Student Health Fee. This option would allow for the expansion that the director of WPI Health Services desires without making any major changes to operations as well as without any extra cost to the students. We have found that the option of third-party-billing is not possible to effectively

implement at Worcester Polytechnic Institute. The large enrollment-requirement of the structure and the low enrollment rates of Worcester Polytechnic Institute are not compatible.

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Chapter 1: Introduction

Health Care is one of the leading industries in the world, with nearly 800,000 hospitals in the United States alone (First Research 2011). The Health Care industry provides millions of people worldwide with employment, and because it is in extraordinary demand, health care is highly regulated by both federal and state governments. Health Care and insurance providers, as well as consumers, must abide by these mandated regulations. Furthermore, along with these regulations come significantly costly Health Care expenses, leading many to wonder how people around the globe can afford to receive proper medical treatment, particularly in a time of emergency or in the case of long-term treatments. One way to better understand how these expenses are managed is to break the Health Care system down into its rudimentary parts.

Health Care providers are categorized into three major levels: Primary Care, Secondary Care, and Tertiary Care. These providers include, but are not limited to, general practitioners, nurses, surgeons, and dentists. Conversely, consumers can be any person who has utilized a hospital or any other form of health care service. Primary care providers are the general physicians who initially investigate a health problem and examine the overall health of an individual at their office, predominantly for routine checkups. If the primary care provider cannot adequately address the patient's problems, they will direct them to a secondary care provider for a more in-depth examination. Secondary care providers are specialists, such as gynecologists or oncologists, who generally have their own private practice. These secondary care providers concentrate on a specified area of health care, and are considered experts in that division. If these specialists cannot fix the health matter at hand, they will recommend a tertiary care provider. Commonly, tertiary care providers are surgeons who administer a one-time procedure and operate out of hospitals.

Each of these providers needs to have many years of education and preliminary experience to become highly trained; therefore, health care usually bears high cost[1]. So, how can everyone be able to afford a visit to the doctor? Health insurance is one of the main sources by which people are able to afford paying medical bills. Insurance companies charge weekly or monthly fees in exchange for protection against paying the full amount of exorbitantly high medical bills, and many times medical insurance is provided via an employer. Furthermore, for an additional cost, an insurance plan can often provide coverage for an entire family. Under the majority of insurance coverage plans, customers will pay a flat fee or a deductible, as opposed to the entirety of the bill, and the insurance company covers the remainder. Health insurance is particularly helpful when an unforeseen, and usually urgent, medical problem arises. Therefore, obtaining health insurance is ultimately the best way to help pay for medical bills, and is mandated in many states.

Given that health insurance is virtually essential, nearly every society has a multiple sites where health services are provided. This means that each college campus is obliged to have a Health Services center to administer aid to students. Generally, these centers' services are limited to routine procedures and are not considered a hospital. The physicians and nurses at these sites can issue basic, routine, actions and serve solely as primary health care providers. However, campus Health Services can also choose to offer services which are not routine, but are still beneficial to college students; such as acupuncture therapy, massage therapy, and dietary services. Health Care at colleges differs slightly from other health care organizations because they do not have the same billing structure as many other health organizations. Some

[1] The average cost of tuition and fees at private medical schools was $42,000 for residents and $43,000 for non-residents. (Association of American Medical Colleges 2011) The length of medical school can range anywhere from 8 to 15 years depending on the area of study. (Go Medical School 2011)

organizations charge one flat fee each year, while others work through third-party insurance vendors, and some charge a flat fee for each individual service. Nevertheless, these billing circumstances only apply to students who do not have a previously established health insurance plan.

Moreover, it is important to note that Massachusetts is known for having one of the most unique health care laws in the United States: the law that was passed in Massachusetts in 2006 which states that all residents are required to have health insurance. If the patient has not provided false information and has submitted his or her premiums on time they are guaranteed the right to renew their health insurance. This law also states that for under no circumstance is an individual to be denied health care. The passing of this law is most advantageous to the middle class, by allowing insurance to be carried from job to job, and also benefits the poor of Massachusetts by reducing the overall cost of health care.

In accordance with the previously mentioned Massachusetts law, students attending Worcester Polytechnic Institute are required to have health insurance, and if a student is not covered by a health insurance plan he or she is not allowed to register for classes. A number of students are currently covered by their parents' employer-sponsored health plan, or have purchased health insurance from a public agency. For the remainder of the student population who do not have health insurance, Worcester Polytechnic Institute offers them the opportunity to purchase health insurance through Harvard Pilgrim Health Care. The health insurance plan costs approximately $1,129.00, and expires after a period of one year.

Worcester Polytechnic Institute Health Services is currently operating on a bi-annual student health fee, which currently is the only source to generate revenue. As the WPI student

population grows each year, additional revenue is necessary to ensure the quality and efficiency of service provided by WPI Health Services. However, less than 40% of the money acquired from the fee goes directly to aid Health Services. The remainder is distributed to other services on campus, such as the Student Development and Counseling Center, who do not generate revenue from the services they provide. A more detailed description of the current billing process can be found in section 2.4.2. In order to better serve the changing needs of the students and the organization, additional full-time staffing as well as additional hours for part-time staff are needed. Health Services on the Worcester Polytechnic Institute campus is driven by a desire to explore alternatives to their current bi-annual student health fee, so the organization may provide more services and staffing to the students.

One alternative revenue structure that WPI Health Services could implement to produce revenue is the practice of third party billing. Third party billing involves the payment of and adjustment to claims via an outside vendor. Meaning that rather than the service provider, WPI Health Services for example, performing the tasks of billing and processing, an outside vendor is brought in by the insurance company to do the work. This form of health care payment is useful because it speeds up transactions, eliminates the time wasted on having to directly handle claims, and simplifies transactions. A disadvantage however, is that when this is implemented on a campus with a small population, it can cost more for the student (Turner, H. Spencer 2002).

The second alternative is fee-for-service, which requires the service provider be paid a flat fee for each separate service they perform. The fee-for-service model is broadly separated into two major areas; basic coverage and major medical. Basic coverage covers common needs like typical doctor and hospital visits, and major medical is implemented when the basic coverage runs out. Some advantages of the fee for service structure include the ability generate

revenue through the fee allotted to each procedure; the capability of not only choosing the provider but also the hospital, and doctor; the potential to reduce the cost to students by lowering or eliminating the overall student health fee; and allowing for more accurate financial data, which can create better financial projections. The major disadvantages associated with this structure are that students may not want to pay out-of-pocket in the office for a routine check-up procedure, and implementing this procedure may prove to not generate substantial revenue because of a decrease in students visiting Health Services. These advantages and disadvantages will be further explained in chapter 2 (Turner, H. Spencer 2002).

The goal of this project is to research third-party-billing and fee-for-service operational plans, as well as further investigate student health fees, and to determine which method, if any, would maximize cost-efficiency for WPI Health Services. In maximizing the cost-efficiency, our group is hoping to allow WPI Health Services to hire more workers and improve the services they offer students. This will be accomplished by researching Massachusetts rules and regulations on health insurance for students, investigating health service plans at several colleges around the state, surveying the student population for their opinions, and analyzing the current financial data of WPI health services.

A crucial element to the examination of our project was the survey we conducted amongst the WPI student population. We received an overwhelming number of responses, which showed that many students have an interest in our project's topic. Furthermore, the feedback we received was very conclusive in some aspects.

First and foremost, the feedback received showed that many students, even those who have attended WPI for four years, are not only unaware they pay a student health fee, but are

also unaware of how much they are paying. Also, many students were not aware of all the services they are offered by WPI Health Services, and were unwilling to pay more in order to receive more services. We concluded that many students would like to have better staffing in the Health Services Department, and would also like to see a facility that is more centralized on campus. A final area many students had concerns with was the hours that the Health Services facility is open and when they could make appointments. A large amount of students were unhappy with the fact that they could not get appointments until two days after they had called, when they were feeling violently ill.

Overall, the survey results showed that many students had either a neutral feeling toward Health Services, or they hoped for some improvements. This shows that if the percentage of the budget allotted to Health Services could be increased, that many student would be happier because better staffing could be hired to tend to their health needs.

Currently, the director of the Health Services here at Worcester Polytechnic Institute is looking to add either one full time nurse practitioner, or one full time nurse practitioner and one full time physicians' assistant to her medical staff as a way to help improve the level of constant quality care that the students at this college are in desperate need of. Our MQP group set out to determine whether or not increasing the student health fees, adding a fee for service plan, and implementing third party billing would generate enough revenue to cover the costs of adding more personal to the Health Services' medical staff. We developed a scenario analysis to determine how much the student health fees would need to be increased by and how much the fee for service plan should cost. As for the third party billing, our MQP group performed extensive research and interviews with directors of nearby college Health Services on the subject of third party billing. Further breakdown of the scenario and third party billing analysis can be

found in chapter 4.3. After final calculations and research, here are our findings and recommendations from the scenario and third party billing analysis.

- Scenario 1A: In order to hire one full time nurse practitioner, the student health fees would need to be increased by an additional $77.58 which would make the total student health fee $397.58.
- Scenario 1B: In order to hire both a full time nurse practitioner and physicians' assistant, the student health fees would need to be increased by an additional $155.16 which would make the total student health fee $475.16.
- Scenario 2A: Health Services would need to add a fee for service plan of $20.35 to cover the costs of hiring one full time nurse practitioner.
- Health Services would need to add a fee for service plan of $40.70 to cover the costs of hiring both a full time nurse practitioner and physicians' assistant.

After extensive research and interviews with directors of nearby college Health Services on the subject of third party billing, our MQP group determined that third party billing could indeed generate more revenue for the Health Services here at Worcester Polytechnic Institute. Unfortunately, our MQP also determined that it was structurally impossible for the director to implement third party billing at the Health Services of WPI at this time. This was due to the consensus among the directors of nearby college Health Services that the size of the student body population played a key factor in determining if it was structurally possible to implement third party billing. Among the colleges that our MQP group interviewed, College B had the highest number of enrolled students at over 6,400. The college with the second highest student body population was College D with over 4,800. College B has enough students to implement third party billing while College D does not. Worcester Polytechnic Institute which currently has

3,746 students does not have a large enough student body population to implement third party billing. Worcester Polytechnic Institute can implement third party billing at the Health Services in the future if the student body population reaches close to 6,400.

Chapter 2: Background

2.1 Health Care in the United States

As previously mentioned, the Health Care Sector is one of the leading industries in the United States. It includes "more than 6,500 general hospitals; 75,000 nursing homes and residential care facilities; 13,000 diagnostic labs; 30,000 outpatient clinics; 140,000 dentist offices; 220,000 doctor offices; and 150,000 family and social services providers." The largest operation in the Health Care Industry is hospital care, followed by outpatient care, which shows that typical health care customers are seeking either emergency care or routine check-ups (U.S. Department of Health and Human Services 2011; 1 First Research 2011).

Unlike many other countries, the United Sates has no central agency that governs the health care system. (Shi and Singh, 2008) Although there is no central agency, the federal government is a large contributing factor to the rules, regulations, funding, and other services of the Health Care Sector. Furthermore, the government provides health insurance such as Medicare, to citizens who cannot obtain health care through their family or employer, or those who cannot afford it (U.S. Department of Health and Human Services 2011; 1 First Research 2011).

According to FirstResearch, the United States output for health care is expected to grow over the span of the next several years. This is due mainly to the boost in innovation within the industry, as well as the changing of many government regulations.

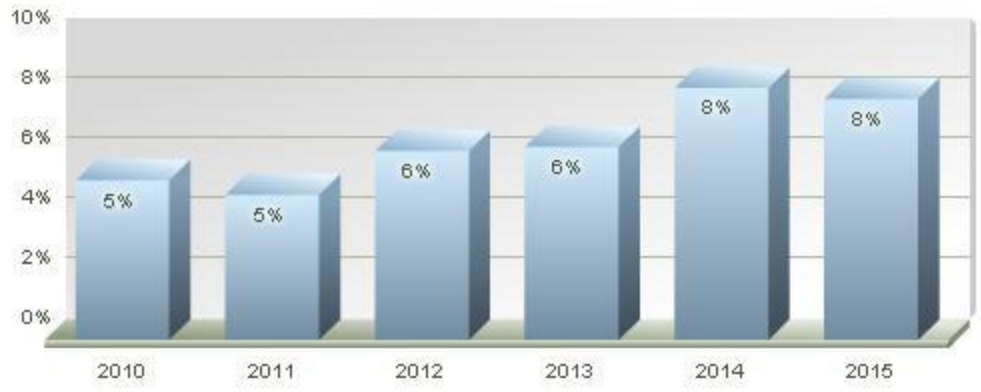


Figure 1: Growth in Health Care Steadily Strengthens
(U.S. Department of Health and Human Services 2011; 1 First Research 2011)

2.1.1 General Health Insurance

Health insurers establish contracts with health care providers, and serve as a financial intermediary between health care providers and consumers. There are several different routes consumers can choose from when purchasing insurance, including Health Maintenance Organizations (HMO), Preferred Provider Organization (PPO), Point of Service (POS), and indemnity benefit plans. HMO plans are perhaps the most cost-contained plans that are offered. The consumer is able to pick a primary health care doctor from a previously established list of doctors within an insurer's network. PPO plans allow the consumer to access any of the providers in that insurer's network, but outside services are also available for an additional cost. POS plans are a combination of HMO and PPO plans. Consumers can pick a primary health care doctor and access any of the providers and services in that insurer's network. On the whole, PPO and POS plans are commonly more expensive than HMO plans, but allot more flexibility and choice to the customer (First Research 2011).

2.1.2. Medicaid and Medicare

There are two health insurance programs, Medicaid and Medicare, currently established in the United States. Medicaid involves federal and state law insurance that is available to low-income individuals and families. Medicare is a federal law insurance program that does not involve the state. Under Medicaid, each state sets their own guidelines regarding eligibility and services. Medicare's guidelines, however, are the same nationwide. A wide range of adults can be covered by Medicaid, but there are certain requirements that must be met. Children are also eligible for Medicaid, regardless of whether or not their parents are not. Eligibility for Medicare is only available to three groups: those who are 65 and older, people with disabilities, and people with end-stage renal disease. The rules of eligibility regarding income for Medicaid vary, but the eligibility regarding income for Medicare is not accounted for and is instead tied to employment status. These health insurance programs were among the first state-wide insurance programs to be available (U.S Department of Health & Human Services 2011 and SHIP Resources).

2.1.3. The Affordable Care Act

In March, 2010, the Affordable Care Act was passed by Congress and the President of the United States. This Act, which will be implemented through 2014, will ultimately "hold insurance companies more accountable, lower health care costs, guarantee more health care choices, and enhance the quality of health care for all Americans" (U.S. Department of Health and Human Services). The cost of insurance is expected to go down for millions of families and small business owners through the various implementations stated in the Affordable Care Act. The first step in the process to achieving affordable care is setting up a new private health insurance market. This makes affordable health care coverage available to millions of Americans. The next step holds insurance companies more accountable by preventing the number of denials of insurance coverage, as well as addressing other abuses that the insurance

industry has made in the past. This will increase the risk that insurance companies take and will possibly lead to increased costs for them. The final implementation cuts government overspending and cracks down on fraud regulation. This is expected to reduce the country's deficit enormously within the next several years, and will ultimately put the nation's economy in a stable condition once again.

Perhaps the most important benefits of the Affordable Care Act have already been implemented and put into effect. For example, this year in Massachusetts alone 4.2 million people no longer have lifetime limits on health care coverage. A lifetime limit sets a boundary of the amount of benefits that you can receive from your insurance company over your lifetime. Another recent execution allows most young adults to stay covered under their parents' insurance plans until the age of 26, and this year in Massachusetts 10,100 young adults will gain coverage as a direct result of this implementation. Furthermore, roughly 340,000 children with pre-existing conditions will also gain coverage in Massachusetts this year due to recent ACA implementations (U.S. Department of Health and Human Services 2011).

Several grants were also awarded this past year in order to aid in various aspects of the Affordable Care Act. For example, a $743,000 grant has been awarded in an effort to protect consumers from bad insurance practices. Additionally, $1,000,000 was granted in order to help officials enforce the justification of unreasonable increases in insurance rates. Another $24,300,000 was granted to help illness prevention efforts across the country. These are only some of the benefits of the Affordable Care Act that have already been executed (U.S. Department of Health and Human Services 2011).

2.2 Health Care in Massachusetts

Massachusetts is one of the handful of states that mandates by law that its citizens must have health insurance. Additionally, unless an individual had lied about their information or failed to pay their insurance premiums in a timely manner, they are secured the right to renew their health insurance plan. Furthermore, Massachusetts medical insurance cannot limit access to the individual solely because they do not have an employer.

2.2.1 Reform in Massachusetts

In 2006, Governor Mitt Romney deregulated the traditional system that the health care in Massachusetts had followed for twenty years. With ultimate success he was able to push through legislation and pass a new reform. As a result, most Massachusetts citizens were able to gain health care coverage, because the law required all residents purchase health insurance by July 1, 2007. Those who did not purchase health insurance by 2008 would be penalized by the legislation. The legislation deducted 50% of the total cost of an annual health care plan from their tax returns (Steinbrook, Robert 2006).

The intent of the reform was to make uninsured states' purchase insurance. However, more came out of the reform than was anticipated; it was through this reform that *The Commonwealth Care Health Insurance Connector* was created. This Connector was implemented to help individuals purchase their health care coverage though competing companies, and enable a majority of people to purchase insurance through the clearinghouse. This reform has also affected employers by forcing them to contribute money towards a $743,000 grant awarded to employees' health care coverage through the Connector, regardless of how many hours they worked. All things considered, the Connector has reversed the common approach that was used to regulate health insurance in the past. In the years leading up to the reform, rising health care costs

and ever-increasing health insurance premiums resulted in a growing number of uninsured residents in Massachusetts, as well as increased demand from the health care system. In 2004, the Commonwealth's household insurance survey estimated that there were 460,000 people in Massachusetts without health insurance, up from 418,000 just two years earlier. (Lischo, Amy; Gopalsami, Anand 2010) The reform helped health care become more flexible by allowing the change of an insurance plan during the annual open enrollment period, and by allowing plans to be carried through job employment.

Now a more free-market approach has been applied to the health care industry in Massachusetts, not only by the benefits that came from creating the *The Commonwealth Care Health Insurance Connector* but for many other reasons. One example is the allowance of managed care specialists to offer Health Saving Account plans for medical coverage. The Health Savings Account (HSA) was established in 2003 in order to help people save money on health care. Health savings accounts are similar to personal savings accounts, but the money they hold can only be used for health care expenses. HSA is only eligible for individuals who are covered by high-deductible health plans. People who use HSA can receive tax-preferred treatment of the money saved for medical expenses. (Mayo Foundation for Medical Education and Research, 1998) Similarly, the law also provides some breaks for young adults, pertaining to what coverage they need to have; the market opened up more affordable plans to this demographic.

Although Mitt Romney was often criticized for his demand on health insurance coverage as well as and the mandate on the residents of Massachusetts, he never stopped pushing. He knew that with the uncertainty in the insurance market at the time it would not be productive for residents to purchase insurance. Once the reform was put in place, it was better understood because of the resulting alignment and decrease in market expense. Mitt Romney's goal was to reduce the cost of health insurance enough so that low income families and the middle class could benefit from the reform. The health insurance restructuring is recognized as one the most

unique reforms in the United States because of the deregulation, creation of a clearinghouse, and statewide mandate (Steinbrook, Robert 2006).

2.2.2 Guaranteed Issue Health Insurance

Guaranteed Issue Health Insurance is a variation of health insurance that is beneficial to those who have been previously denied health insurance. It is also beneficial to people with pre-existing medical conditions that have prevented them from getting coverage. When applying for traditional health insurance plans, applicants are asked general questions pertaining to their medical history and prior medical conditions to determine eligibility. The "guaranteed issue" policy does not come into play in relation to these two aspects (All Web Leads, Inc. 2005).

Insurance companies' requirements and offers differ in relation to the guaranteed issue health insurance. On some occasions a reasonably healthy person, who is qualified for a traditional health insurance plan, may be denied by traditional health insurance companies. This is because the definition of "healthy" may differ between insurance companies. For example, if someone were to have a surgery and then recover, an insurance company might deem that patient as "uninsurable". This health insurance does not exclude people that have a regular health insurance policy, and occasionally, even though a person has health insurance, pre-existing medical conditions may be excluded from coverage. If this occurs, he or she is able to apply for guaranteed issue to cover expenses and obtain more coverage (All Web Leads, Inc. 2005).

2.2.3 MassHealth

The MassHealth program provides health care insurance for many low and middle income residents of Massachusetts. The program also pays all or part of the insurance premiums for individuals and families who cannot afford to buy health insurance on their own. Depending on the applicant, the way the program determines your eligibility may differ. For residents under

the age of sixty-five MassHealth takes into account the residents' family size. For residents over sixty-five years of age MassHealth takes into account the applicants assets. Most of the guidelines they follow to determine how much assistance you will receive is taken from the state and federal poverty guidelines. Through MassHealth there are many different coverage programs available for different situations. Even if you already have health insurance you are also eligible to apply for MassHealth. In this occasion MassHealth will help pay for expensive health insurance bills. The goal of the program is to be able to provide some type of assistant of health care for all residents of the state (Community Resources Information, Inc 2011).

2.3 Health Care at Colleges

There are a number of services and support systems that influence the lives of students in the United States attending higher education. College life is made up of several aspects of student learning and student life. The health program is an aspect that has high importance to college life. Going back in time the health program was implemented revolving around hygiene and physical fitness. Hygiene became a part of students' curriculum and physical fitness was introduced. Over time, health replaced hygiene and institutions realized the only way to keep a student healthy was by having a Student Health Services center.

2.3.1 History

In the history of high education there have been numerous health issues such as epidemics of infectious diseases that had been spreading. If a student were to become ill they were then unable to enroll into school because of the closeness of residential services. However in the early 19th century institutions had come up with a new approach on dealing with the illnesses. This approach was a plan that would focus mainly on a method of protection for the students. The Board of Education knew that this would not be enough for the student health services. The next step would be the development of hygiene and physical education programs.

Several factors contributed to the implementation of this new program that later became mandatory in higher education. This program would be developed by involving activities both in and out of the classroom. It was thought that the best way to improve students' health would be through exercise. The first five colleges to establish the gymnastics program were Harvard, Dartmouth, Williams, Yale, and Amherst. When it comes to controversy of which institution first introduced hygiene education, researchers have trouble knowing if it was Harvard or Amherst. It could be best stated that both institutions had different involvement.

Harvard is known for introducing hygiene into the classroom curriculum while Amherst could be known for the innovating of hygiene education into student health service. The earliest presidents of Amherst College were Reverend Dr. Edward Hitchcock and Stearns. They both enforced the need of health care as much as education. With the issue of students not finishing academic requirements and dropping out of college, they strongly felt they needed to do something. Following Stearns, Reverend Hitchcock's son, Dr. Edward Hitchcock, became the president of Amherst. He would be known for developing the formal college health program. This would include physical fitness classes to recording individual student medical care. This plan became known as the hygiene program. Later on it was observed that the care of athletes was also needed. Health services would then be a combination of athletic and physical education departments.

The effects of World War I forced colleges to build a student health facility. When students were unable to be drafted, universities would do health inspections to find out what was wrong with the students. This was needed so that they could take care of the students while in school. The care of the student would be given by a nurse in infirmaries. This was not free and would cost students roughly $1.50 per day. After the college health program was implemented

nationwide in 1920, an association was formed dedicated to college health. This association was called American Student Health Association, which is now known as American College Health Association.

With the rapid occurrence of colleges implementing this health service model, a man by the name of William Hughes decided to write a book. This book was a guide for student health professionals. It would discuss the model of student health services including the financial information. In the history of student health the financial aspect has always been the same. Services are either funded by general funds through the universities and/or from student fees. This budget would help pay for staff salaries and supply cost. When insurance became available it was only provided for some students.

2.3.2 Current Status

With all of the hot topic issues concerning the U.S. health care system, not a lot of attention is paid to the practice of college health. College students are the x-factors and enigmas when it comes to the practice of college health. Problems arise from trying to figure out how to administer proper care to these college students. For the most part, students who are entering or have already spent a few years in college are still developing mentally and physically.

Health Services at colleges are placed in the administrative line of student services or student development. Sometimes, Health Services may be place under general campus services along with the maintenance and public safety departments. The availability of information or financial data of the Health Services to the public may vary depending on how open or strict the administration of the college is. Health Services plays an important role in helping their colleges pass the accreditation process which is crucial in order for the colleges to receive federal

financial aid for their students. This is done by the Health Services fulfilling the sections on student services and student health in the colleges' accreditation process.

College administrations rely on the knowledge and guidance of the nurse practitioner/director in operating their health services on campus. The duties of the nurse practitioner/director at the Health Services may vary depending on the size and amount of resources available at their disposal. There are many responsibilities placed on the shoulders of the nurse practitioner/directors. Their responsibilities at the health facility may range from carrying out tasks such as secretarial, administrative, or academic work. The nurse practitioner/director is also in charge of providing health promotion and health care to the college students. At the health facility, the nurse practitioner/director oversees a staff that may include a number of other physicians, registered nurses, and health care personnel.

The Health Services staff of professionally trained physicians and nurses is always ready to provide treatment for students who may at some point fall victim to a wide range of illnesses, symptoms, or even injuries while attending college. The services provided to these students by the Health Service may vary from college to college. Services range from evaluation of eating disorders, preventative health counseling, screening immunization, sexual health, reproductive health, physicals for sports participation, and sports medicine clinics. Other than the services just mentioned there are also primary care, urgent care, and specialty care as well. Specialty care includes women's and men's health clinics which may consist of STD testing, and birth control.

Another type of health care service provided by the Health Services is the wellness program. The wellness program plays an important role in providing students with health care. The wellness programs offer students the chance to go to health fairs and special health-themed

events. The health fairs help promote student health services and participation in health related issues. Special health-themed events are created to provide depression screenings, dietitian care, ending tobacco use, body massages and free flu shots. Since some Health Services do not have enough resources, number of staff, or even revenue to provide certain health care services, they tend to team up with other departments in promoting healthy living. The departments may include the athletics, nursing, sociology, psychology, or even the student health advisory council.

2.3.3. The Affordable Care Act's Effects on Student Health Care

The Affordable Care Act is not only beneficial to millions of families, senior citizens, and businesses throughout the country, but it is also highly beneficial to students with health insurance provided via their school. Many students have insurance coverage through a family member. However, there are many students to who health care is unavailable, or unaffordable, in this manner. Since some states now require every resident to have some type of health insurance, these students' best option is to obtain insurance through their school. Under the Affordable Care Act, student health insurance is defined as "individual health insurance coverage." This protects the students in many ways, including the fact that insurance providers can no longer drop coverage of a student under a student health plan when he or she gets sick, have made a mistake on an application, are under the age of nineteen years, due to a pre-existing condition, and they can no longer "impose lifetime dollar limits on the amount they spend on health benefits in student health plans" (U.S. Department of Health and Human Services 2011).

2.3.4 Problematic Concerns of Health Care at Colleges

Some Health Services on college campuses find themselves unable to provide quality care to the entire student population. This is mainly due to college administration regulations, budget cuts, or low amounts of revenue being produced for the health facility. Without enough funds, several Health Services find they are under-staffed or are ill-equipped to handle any

serious outbreaks on campus. The nurse practitioner/director and her staff have to work within their means at the health facility in their attempt to provide quality health care to their students. Whichever funds or budget the Health Service receives from their college administration must be spent wisely.

2.4 Health Care at Worcester Polytechnic Institute

2.4.1 The Mission Statement

The mission of Worcester Polytechnic Institute's Health & Wellness Services is to provide services to all WPI students that will assist them in achieving and maintaining optimum physical and emotional health. This is done through providing comprehensive, high quality, and cost effective care. Additionally, Student Health Services is committed to working with students to assist them in acquiring knowledge and skills necessary to develop and enhance healthy attitudes and behaviors that will promote high level wellness. Health services will support students in their personal and academic development consistent with the mission of the university. (http://www.wpi.edu/Admin/Health/about.html)

2.4.2 Current Status

The Health Services at Worcester Polytechnic Institute currently implements a "Student Health Fees" model. The majority of the Health Services' revenue comes from billing students a health fee of $320.00 per school year. This health fee is mandatory for all undergraduate students and is part of their college tuition bill. As you can see in Figure 2, costs for the student health fees at Worcester Polytechnic Institute have been increasing over the past several years. The Health Services does not receive any revenue from the health insurance plans but it does receive revenue from the student health fees.

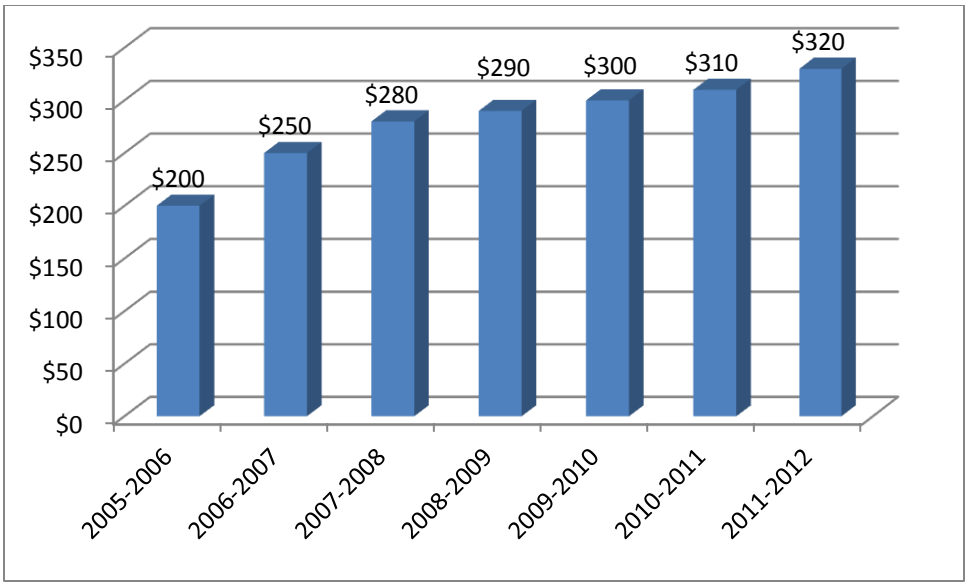


Figure 2: Student Health Fees

Currently, only less than 40% of the total revenue from the student health fees actually goes into the Health Services budget. You can see this in Table 1. In Figure 3, the darker blue bars show the total amount of revenue collected from student health fees while the lighter blue bars show the total amount of revenue given to the Health Services budget for that given school year. Revenue from the student health fees is mainly used to pay the salary of the staff at Health Services, the wellness programs, as well as purchasing vaccines and medical supplies. This is reflected in Table 2. In Figure 4, the light blue bars represent the 60% of the Health Service budget that is used to pay the salary of the staff while the dark blue bars represent the 40% of the budget that is used to purchase medical supplies and equipment. Any revenue that is not currently being used is put away into a savings account for future Health Services purchases.

School Year	Total amount of revenue collected from student health fees	Total amount of revenue given to Health Service budget	Student health fees
2005-2006	$570,200.00	$222,378.00	39%
2006-2007	$715,250.00	$278,947.50	39%
2007-2008	$844,480.00	$329,347.20	39%
2008-2009	$916,400.00	$357,396.00	39%
2009-2010	$1,017,300.00	$396,747.00	39%
2010-2011	$1,096,470.00	$427,623.30	39%
2011-2012	$1,198,720.00	$467,500.80	39%
Average Growth	13.356	13.356	39

Table 1: Total amount of revenue collected from student health fees and Total amount of revenue given to Health Service budget.

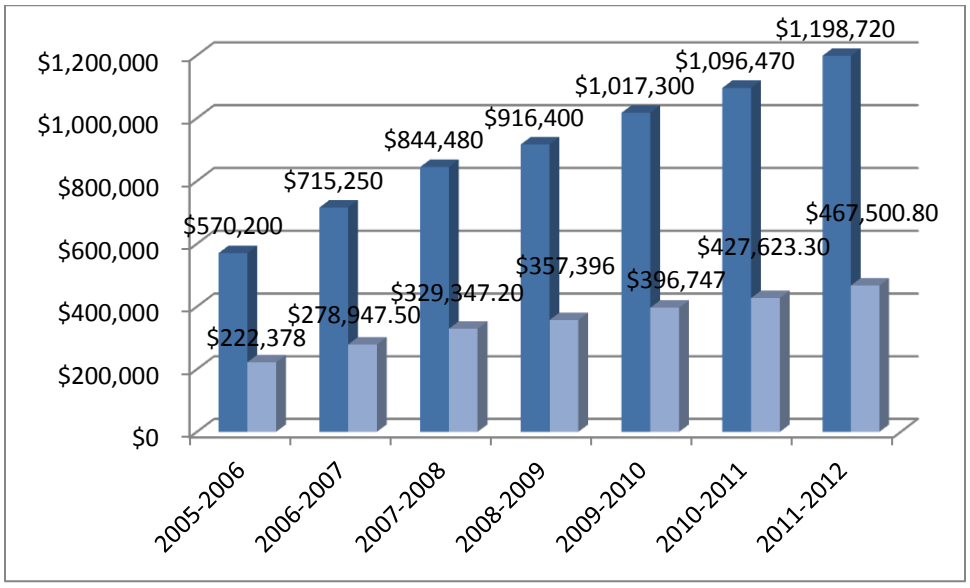


Figure 3: Total revenue from the student health fees and the Health Services budget.

School Year	Estimated amount of funds in the budget used to purchase medical supplies/equipment	Estimated amount of funds in the budget used to pay the staffs' salary	Ratio of staffs' salary to funds used for medical supplies/equipment
2005-2006	$88,951.20	$133,426.80	60%
2006-2007	$111,579.00	$167,368.50	60%
2007-2008	$131,738.88	$197,608.32	60%
2008-2009	$142,958.40	$214,437.60	60%
2009-2010	$158,698.80	$238,048.20	60%
2010-2011	$171,049.32	$256,573.98	60%
2011-2012	$187,000.32	$280,500.48	60%

Table 2: Estimated amount of funds in the budget used to pay the salary of the Health Services' staff and to purchase medical supplies/equipment.

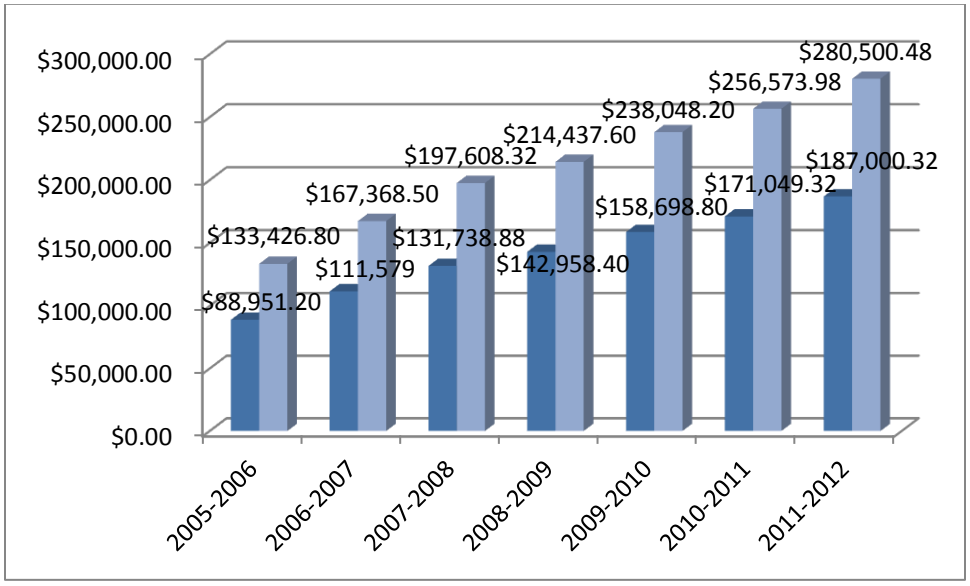


Figure 4: Salary of the Health Services' staff and amount of funds spent on medical supplies/equipment.

Worcester Polytechnic Institute this year had a total of 3,746 registered undergraduate students. The number of total enrollment at Worcester Polytechnic Institute for this 2011-2012

academic school year as well as the other previous school years is shown in figure 5. Figure 6 displays the number of visits to Worcester Polytechnic Institute's Health Services.

According to The National Association of School Nurses (NASN), it is recommended that there should be a ratio of one nurse for every 750 well students. With 3,746 registered undergraduate students for the 2011-12 school year, the Health Services at Worcester Polytechnic Institute needs to have a combination of at least 4 nurses/physicians to satisfy the nurse to student ratio. The Health Services at Worcester Polytechnic Institute is able to meet this ratio by employing two full time nurse practitioners, one full time registered nurse, and three contract medical doctors. Overall, the Health Services at Worcester Polytechnic Institute currently has a staff of ten employees including one full time administrative assistant, one registered dietitian, one licensed massage therapist, and one doctor of osteopathic medicine. This staff is tasked with the goal of providing constant quality care to the students.

2.4.3 Statistics

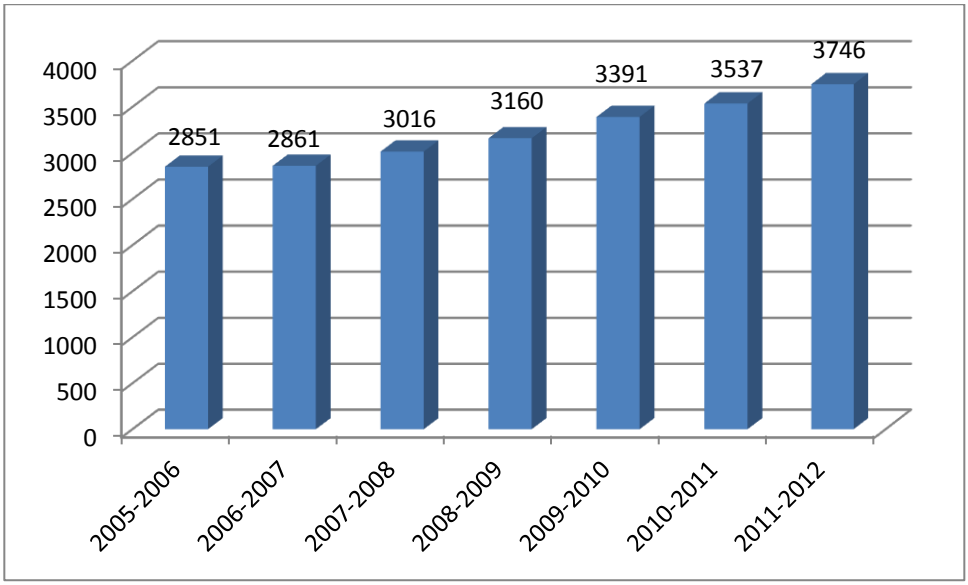


Figure 5: Total enrollment at WPI.

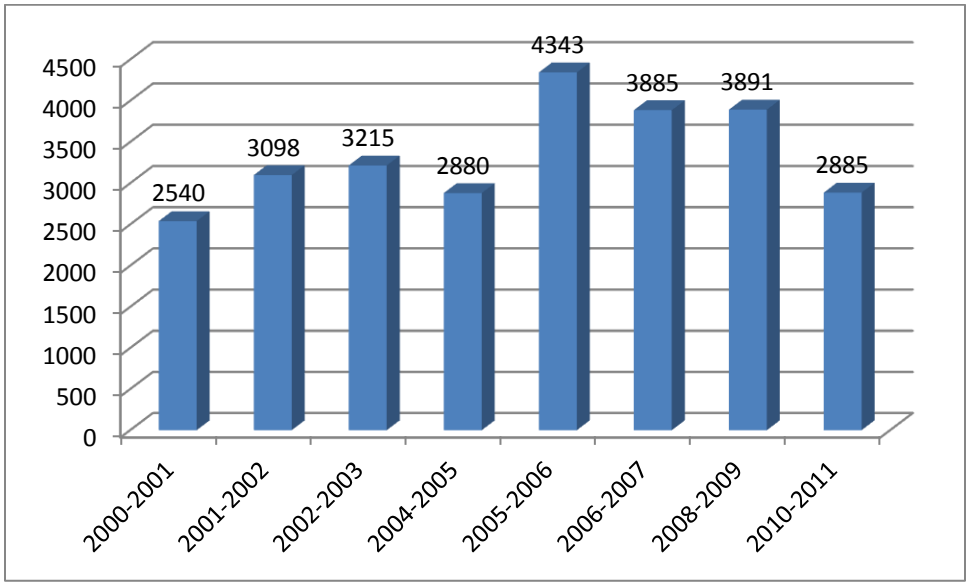


Figure 6: Number of visits to WPI Health Services.

2.4.4 Issues at WPI Health Services

Mrs. Regina Roberto is the current director and nurse practitioner at the Health Services at Worcester Polytechnic Institute. She and her staff of professionally trained physicians and nurses are always willing and ready to help any student who is in need of medical help. As stated earlier, less than 40% of the total revenue from the student health fees actually goes into the budget of the Health Services. With such a limited budget to operate with, Mrs. Regina Roberto finds it a challenge every school year to ensure that every student at Worcester Polytechnic Institute is able to receive the best health care service possible while operating within the means of the budget. Discussed in this section is the issues and difficulties that Mrs. Regina Roberto is forced to deal with.

According to state health regulations, Health Services at colleges are required to have a certain number of vaccines available in stock. Since Health Services at Worcester Polytechnic

Institute receives less than 40% of the total revenue generated from the student health fees for their budget, Health Services is faced with the problem of purchasing the required number of vaccines. Unfortunately, these vaccines must be disposed of once they reach their expiration date. Health Services does not receive any refund or credit for the expired vaccines. This flaw forces the Health Services to repurchase vaccines.

The costs of the vaccines as well as the medical equipment are very expensive. Prices for these items can range from several hundreds to over a thousand dollars. Mrs. Regina Roberto finds it difficult to purchase the required number of vaccines due to the fact that these vaccines might never be used or expire. With the low budget the Health Services receives from Worcester Polytechnic Institute, the funds must be spent wisely.

There is a lack of consistency between physicians and the students here at Health Services of Worcester Polytechnic Institute. Physicians are currently running to multiple facilities which cause a loss of appointments. The physicians may not have time to see their students due to scheduling and patient conflicts at other locations. With more revenue in the budget, the Health Services could increase the physicians' number of working hours or even hire more physicians. Mrs. Roberto feels it is better if students were able to have one primary care physician instead of having to see multiple physicians. Mrs. Roberto would also like to increase the length of work time that the nurse practitioner is available on campus from 10 months to 12 months. With additional revenue the Health Services can stay open for longer hours during the day, be open for business during the weekends and hold more wellness programs.

The Health Services is faced with a shortage of funds to pay for students' transportation costs. Some major medical problems cannot be treated at the health facility at Worcester

Polytechnic Institute. Students with certain illnesses and injuries that cannot be treated at the Health Services are then sent to other medical sites, i.e., the hospital. The campus police are more than happy to offer the students transportation if needed. In certain situations the campus police are not available thus the student is forced to call for a taxi or ambulance. The fee paid for the taxi usually comes from a taxi pool account from the health services while the fees for the ambulance are billed to the students. Sometimes the insurance company pays for a portion of the ambulance fee. If the taxi pool account was to run out of funds or a student cannot pay for the ambulance fees, it would be difficult for the student to get a ride to the hospital.

The current location of the Health Services at Worcester Polytechnic Institute is not an ideal place for students. Currently the health service center is located down the hill on the west side of campus. Most of the classrooms and buildings are located east of the Health Service Center. The newer dormitories were built further to the far eastern side of campus. Students, who cannot find vehicle transportation to the health service, must travel a great distance, sometimes in the harsh weather environment to see a physician. Keep in mind that Worcester Polytechnic Institute is located on a hill. Now if the Health Services Center was located near or in the athletic facilities, injured student athletes would only have to travel a short distance to see a physician. Mrs. Regina Roberto discussed about how beneficial it would be to have the health service center at a site where all the students would have easy access traveling to. In this case, a lot of revenue is needed for the cost of location change of the Health Services. The administration of Worcester Polytechnic Institute could afford to pay for the new location of a Health Services if there were enough available funds in their college budget to accomplish this project.

Mrs. Regina Roberto believes that an increase in financial revenue would help improve the quality of health care service for the students at Worcester Polytechnic Institute. The

"Student Health Fees" model that is currently being implemented by the Health Service is not generating enough revenue to carry out this mission. One possible method is to increase the student health fees. If increasing the student health fees is not feasible, then Mrs. Regina Roberto would like to look at other options. Currently Health Services at other colleges are generating revenue by implementing models such as "third party billing" and "fees for service".

2.5 Structure Options

Thus far, there has not been a great deal of research put into the development of a revenue-producing health services structure. Since the arrival of Director Regina Roberto at the Worcester Polytechnic Institute Health Services, there have been many changes implemented, including the addition of staff members, as well as various facility improvements and expansions. The billing structure, however, has not seen any change from the "student health fees" arrangement for a number of years. Mrs. Regina Roberto has looked into other potential methods and has studied other colleges systems to narrow-down which structures would be most advantageous.

Campus' nationwide implement a variety of billing structures and many are good examples to examine and learn from. For example, Texas State University utilizes the "fees for services" form of revenue generation and charge students a flat rate of ten dollars per visit. Since the initiation of the system the university has been able to make a multitude of improvements and additions to their health services. During the 2010-2011 school years, Texas State was able to expand the medical services and staff, create a Health Promotion Services Department, and launch and support a campus-wide tobacco-free campaign.

Results like those found on the Texas State University campus enforce the need for Worcester Polytechnic Institute to move forward with its efforts to change and progress its health

services. A technique Worcester Polytechnic Institute is using to make strides in improving its services is through the creation of the Student Health Advisory Council (SHAC). This is a council comprised of Worcester Polytechnic Institute students who have an interest in promoting health benefit options to students around the campus. One example of an event run by SHAC in honor of National Women's Health and Fitness Day. For the event SHAC is groups of young women go to different stations and complete tasks that will inform them of women's health issues. After completing a task the women will be entered into a raffle to win a gift card. Furthermore, there will be a nutritionist at the event to inform everyone how to remain healthy and fit while away from home.

Although they WPI health services has been making great strides towards improving the standard of care administered to students, our major qualifying project group hopes to offer health services better plans of revenue generation and fresh ideas to bring to the students of Worcester Polytechnic Institute.

2.5.1 Third Party Billing

Third party medical billing is the practice of contracting an additional party to process payments and claims made by patients to the insurance company. It emerged, and became popular, in the 1950s and has since risen currently employ approximately 20,000 people across the United States, and is responsible for nearly 17 million claims per month, making it, roughly, an 18 billion dollar a year industry. A few of the services performed by the third-party vendors are the posting of payments and adjustments, rectifying or investigating inaccurate payments, formulating insurance claims, and billing patients for deductibles. In a more general sense, third-party billing is most often implemented as a means of reducing complexity, accelerating transactions, improving the handling of specified claim categories, and increasing revenue

production. Although there is a multitude of benefits to third-party billing, one of the only downfalls is that the group handling and processing insurance claims may be separate from the insurance company itself.

2.5.2 Fees for Service

The fee for service health care structure entails providers are paid an amount for each specific service they administer. Initially, this meant that those insured were billed, paid the bill, proposed the bill to the insurance company, and were then reimbursed. This fee for service model can be implemented whether or not there is a contract between the insurance company and the provider, but fee for service rarely pays 100% of what providers' mandate.

Under the fees for service structure, the patient has the freedom to choose not only their provider, but their hospital and doctor as well. Furthermore, patients do not need a referral from their primary care physician to visit can visit specialist consultants.

Generally, fees for service can be broken down into two primary categories; these two categories are basic coverage and major medical. Basic coverage is the expenses related to surgery, hospital visits, as well as various other medical expenses. If the basic coverage were to diminish, major medical would take over, particularly in severe long-term cases amounting to over $250,000.

Potential Fees for Service and Pricing Structure	
Services	**Pricing**
Confidential STI Testing	$15.00
Dietitian	$15.00
Immunization	$10.00
Laboratory Testing	$10.00
Massage	$30.00

Physical Therapy	$50.00
Primary Care Appointments	$15.00
Specialty Appointments	$20.00
Women's Health Care	$35.00

Table 3: Projection of fees created under the fee-for-service structure

2.5.3 Student Health Fees

Currently, WPI uses a student health fee, or prepaid health fee plan. This is a structure that designates payments at a certain time, semester tuition payments for example, and charges for specified area of service, such as the benefits provided by health services. The prepaid health fee plan designates the charges collected, although included in tuition payment, be used expressly for health services and its corresponding branches like massage therapy and physical rehabilitation. This structure is created according to the volume of students expected to attend the college or university for the upcoming year.

Although there are many positives to establishing a prepaid health fee plan there are a few downsides. One disadvantage is that students, who do not frequently utilize the health services, will find themselves paying a fee for something they do not need. Also, the revenue intake will decrease if the student population decreases.

Using the prepaid health fee structure is beneficial to student because, on the whole, it costs less than if students were to have to pay on an individual basis, and students can better budget their expenses because they know how much they will be paying for their health care needs. Furthermore, because the funding is constant and fixed, financial postulations can be made more precisely, and most institutional loans will take care of the fee.

Chapter 3: Methodology

3.1 Survey

Surveys are an important tool and are widely utilized in order to gather and analyze information from a targeted market or consumer. In order to create a successful survey there are a variety of issues to consider, such as the type of the survey to be used, the layout and design of the survey, and the means by which the administrator will elicit a viable response from their target market or consumer. There are three major types of surveys that are available for businesses or individuals to present to their desired market; a written survey, an oral survey, or the completion of an online survey. All of these survey methods have their benefits and weaknesses that must be known to properly execute them as a good survey. Upon completion by the targeted group, those administering the survey are then able to gather the feedback, organize the data, and analyze each for their own purpose or goal.

3.1.1 How to write a good survey

Write a short survey: Distinction essential, useful, and unnecessary questions. If the question doesn't impact your report then you should eliminate the question.

Keep the language simple & relax your grammar: Analyze your audience and write on their level. Avoid using technical terms so that your audience can't misunderstand a question. Relax the grammar in your questions by making formal questions sound more personal.

Assure a common understanding: Write questions based on the common facts and knowledge of the audience that you are sending the survey to.

Start with interesting questions: Start the survey with the most interesting questions that will attract your respondents' attention. Save the questions that are difficult and threatening for them to answer for the end.

Don't write leading questions: Leading questions are questions that demand a specific response. This may affect the way the respondent will answer the question because they will want to answer the questions the right way and not be wrong.

Avoid subjective words & double negatives: Some terms mean different things to different people. Avoid using these words that may have a different meaning to someone else. Also using questions that involve two negative words highly confuse your participant.

Avoid difficult recall questions: Avoid asking questions that involve your participants to recall an event. People's memories are unreliable when you ask them to recall events that occurred further back in time.

Use Closed-ended questions rather than Open-ended ones: Using closed-ended questions is useful because the participant has a clear purpose of the question. They are limited to a set of choices where one answer is right for them. Using open-ended questions may reduce the quality and attention of the response that the participants will give.

Put your questions in a logical order: One question can influence how people think about the subsequent questions. It is good to ask a general question and then ask the more specific questions towards the end.

Pretest the survey: This is the most important step in preparing a survey. Choose a small group of ten people to take the survey before you target your larger audience. This will help you identify any problems with the survey. It also helps them to critique how well your letter cover letter motivates them and how clear your instructions, questions, and answers are.

Naming and Introduction to survey: When it comes to electronic messages some people discard the message entirely based on the subject which makes the title of your survey. Once the respondent has opened the message motivating them to take the survey is the next step. The introduction offers an excellent place to provide the motivation.

Using a survey to develop research it is almost always used in quantitative way. However it can be integrated into qualitative with creative thinking and the right questions. Writing the right questions for a survey is the most complex aspect of a survey. This is because different people often use words in different ways; your goal is to write questions that each person will interpret in the same way. Only through careful writing, editing, review, and rewriting can you make a good survey.

3.1.2 Online Survey

When conducting an online survey there are many sources and websites available through the Internet that could be used. The surveyor enters the questions and available answer choices and the website formats and conducts the survey for you. Surveys are then sent through email. Online surveys are cheap compared to other survey methods (Shonlau 2002). They are delivered instantly and returned instantly. This type of surveys has been known for having a high response rate (Solomon 2001). This is because respondents can get their opinion out honestly and anonymously. On the other hand, only people with accessible to computers can take this type of surveys which may incur self-selection bias or lower the chances of answering

the survey. There could also be technical difficulties with software, which can prevent the survey from being successful.

Once all the data has been collected the surveyor moves on to organizing and analyzing the data. Organizing the date varies depending on the kind of data. If it is numerical, then graphs and charts can be used. Every piece of data collected should be assigned a type of identification number and be filed in an appropriate area. After the data is organized, the surveyor moves on to analyzing the data. Statistical analysis can be used, but it is not always useful if the data is not quantifiable. Finally after all data is organized and analyzed the survey is reported (Colorado State Writing Center 2011).

3.2 Interview

Interviews are one of the most common types of qualitative research. The most basic definition of an interview is one person asking another person a series of questions. Often interviews are given in order to get a person's opinion about one or several topics. Although interviews can be time-consuming, they do produce more detailed results for analysis than other types of qualitative research such as questionnaires. This is also due to the fact that the interviewer can ask follow-up questions if they would like a more in-depth response.

There are several different types of interviews that can be conducted for qualitative research. These include, but are not limited to; the informal, conversational interview; the standardized, open-ended interview; the closed, fixed-response interview; and the general guided interview. Each type of interview has its advantages and disadvantages, and the appropriate interview should be conducted on a case-by-case basis according to the nature of the research.

An informal, conversational interview is the most laid-back type of interview. The interviewer does not generate questions to ask before the interview, instead letting the

conversation proceed in a very natural manner. The interviewer should remain very open-minded to the interviewee's opinions and should let the conversation go in whichever direction in order to generate the most unbiased responses. This interview should be conducted when a structured response is not needed and a very broad, opinionated response is desired.

A standardized, open-ended interview is a combination of different types of interviews. It consists of a list of questions that are asked to each interviewee. However, the questions are open-response and so each response is likely to differ greatly. These interviews can be conducted in a timely manner. While generating different responses, the results are able to be analyzed quicker and easier than conversational interviews because of the fixed set of questions.

A closed, fixed-response interview is one of the fastest interviews to conduct. The interviewer has a set list of questions to ask each interviewee, and the interviewee has a set list of answers to choose from. This is much like a questionnaire but differs in that it is given verbally. This interview should be conducted when the interviewer is not experienced in the practice of interviewing.

A general guided interview is very much like an informal, conversational interview, but differs in that there is a set list of topics that should/can be discussed. This just allows the interview to have a little more structure and guidance, making sure the same general areas are touched upon. This type of interview still allows for an open, conversational feeling.

Conducting an interview should be well prepared-for, and the interviewer should be ready for anything. The interviewer should be interactive with the interviewee and should be ready to be familiar with the language and concepts that the interviewee might be speaking about. The goal should be to get the opinions of the interviewee in as much detail as possible. It

is extremely important that the interviewer is completely confident in understanding the responses of the interviewee. Assumptions should not be made, and all information should be made clear before ending the interview since it is unlikely that this person will be able to be contacted for follow-up questions (BMJ 1995).

3.3 Scenario Analysis

In Scenario 1A, our group will see if it is feasible to add one full time nurse practitioner to the Health Services' staff by increasing student health fees. First we multiply the number of enrolled students by the increased number of student health fees to get to get the total student health fees. The Health Services receives a certain percentage of the total student health fees. From there, we subtract the total revenue (or total budget of the Health Services) from the total expenditure to obtain the net profits. The total expenditure is the sum of the payroll, costs of medical supplies/equipment, and the additional salary of one full time nurse practitioner.

SCENARIO 1A

-Add 1 Full Time Nurse Practitioner
-Increase Student Health Fees by $
Revenue
Total Student Fees = (Number of enrolled students * costs of new student health fees)
Total budget for Health Services = (Total student fees * %)
Total Revenue = Total budget for Health Services

Expenditures
Payroll = (percentage of total budget for Health Services)
Medical supplies/equipment = (percentage of total budget for Health Services)
1 Full Time Nurse Practitioner = average salary of 1 Full Time Nurse Practitioner
Total Expenditures = (payroll + medical supplies/equipment + 1 Full Time Nurse Practitioner)

Net Profits = Total Revenue - Total Expenditures

In Scenario 1B, our group will see if it is feasible to add one full time nurse practitioner to the Health Services' staff by implementing fees for service. First we multiply the number of

enrolled students by the increased number of student health fees to obtain the total student health fees. The Health Services receives a certain percentage of the total student health fees. We then add the additional revenue gained from the fees for service to obtain total revenue. From there, we subtract the total revenue (or total budget of the Health Services) from the total expenditure to obtain the net profits. The total expenditure is the sum of the payroll, costs of medical supplies/equipment, and the additional salary of one full time nurse practitioner.

SCENARIO 1B

-Add 1 Full Time Nurse Practitioner
-Implement fees for service
Revenue
Total Student Fees = (Number of enrolled students * costs of new student health fees)
Total budget for Health Services = (Total student fees * %)
Total Revenue = Total budget for Health Services + Implement fees for service

Expenditures
Payroll = (percentage of total budget for Health Services)
Medical supplies/equipment = (percentage of total budget Health Services)
1 Full Time Nurse Practitioner = average salary of 1 Full Time Nurse Practitioner
Total Expenditures = (payroll + medical supplies/equipment + 1 Full Time Nurse Practitioner)

Net Profits = Total Revenue - Total Expenditures

In Scenario 1C, our group will see if it is feasible to add one full time nurse practitioner to the Health Services' staff by switching to a third party billing service. The total revenue will be generated from the third party billing service. From there, we subtract the total revenue from the total expenditure to obtain the net profits. The total expenditure is the sum of the payroll, costs of medical supplies/equipment, and the additional salary of one full time nurse practitioner

SCENARIO 1C

-Add 1 Full Time Nurse Practitioner
-Switch to Third Party Billing Service
Total Revenue = Revenue generated by switching to Third Party Billing Service

Expenditures
Payroll = (% of total revenue)
Medical supplies/equipment = (% of total revenue)
1 Full Time Nurse Practitioner = average salary of 1 Full Time Nurse Practitioner
Total Expenditures = (payroll + medical supplies/equipment + 1 Full Time Nurse Practitioner)

Net Profits = Total Revenue - Total Expenditures

In Scenario 2A, our group will see if it is feasible to add one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff by increasing student health fees. First we multiply the number of enrolled students by the increased number of student health fees to obtain the total student health fees. The Health Services receives a certain percentage of the total student health fees. From there, we subtract the total revenue (or total budget of the Health Services) from the total expenditure to obtain the net profits. The total expenditure is the sum of the payroll, costs of medical supplies/equipment, and the additional salary of one full time nurse practitioner and one full time physicians' assistant.

SCENARIO 2A

-Add 1 Full Time Nurse Practitioner and 1 Full Time Physicians' Assistant
-Increase Student Health Fees by $
Revenue
Total Student Fees = (Number of enrolled students * costs of new student health fees)
Total budget for Health Services = (Total student fees * %)
Total Revenue = Total budget for Health Services

Expenditures
Payroll = (60% of total budget for Health Services)
Medical supplies/equipment = (40% of total budget for Health Services)
1 Full Time Nurse Practitioner = average salary of 1 Full Time Nurse Practitioner
1 Full Time Physicians' Assistant = average salary of 1 Full Time Physicians' Assistant
Total Expenditures = (payroll + medical supplies/equipment + 1 Full Time Nurse Practitioner and 1 Full Time Physicians' Assistant)

Net Profits = Total Revenue - Total Expenditures

In Scenario 2B, our group will see if it is feasible to add one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff by implementing fees for service. First we multiply the number of enrolled students by the increased number of student health fees to obtain the total student health fees. The Health Services receives a certain percentage of the total student health fees. We then add the additional revenue gained from the fees for service for the total revenue. From there, we subtract the total revenue (or total budget of the Health Services) from the total expenditure to obtain the net profits. The total expenditure is the sum of the payroll, costs of medical supplies/equipment, and the additional salary of one full time nurse practitioner and one full time physicians' assistant.

SCENARIO 2B

-Add 1 Full Time Nurse Practitioner and 1 Full Time Physician Assistant
-Implement fees for service

Revenue

Total Student Fees = (Number of enrolled students * costs of new student health fees)
Total budget for Health Services = (Total student fees * %)
Total Revenue = Total budget for Health Services + Implement fees for service

Expenditures

Payroll = (60% of total budget for Health Services)
Medical supplies/equipment = (40% of total budget for Health Services)
1 Full Time Nurse Practitioner = average salary of 1 Full Time Nurse Practitioner
1 Full Time Physician Assistant = average salary of 1 Full Time Physician Assistant
Total Expenditures = (payroll + medical supplies/equipment + 1 Full Time Nurse Practitioner and 1 Full Time Physician Assistant)

Net Profits = Total Revenue - Total Expenditures

In Scenario 2C, our group will see if it is feasible to add one full time nurse practitioner and one full time physician assistant to the Health Services' staff by switching to a third party billing service. The total revenue will be generated from the third party billing service. From

there, we subtract the total revenue from the total expenditure to obtain the net profits. The total expenditure is the sum of the payroll, costs of medical supplies/equipment, and the additional salary of one full time nurse practitioner and one full time physician assistant.

SCENARIO 2C

-Add 1 Full Time Nurse Practitioner and 1 Full Time Physician Assistant
-Switch to Third Party Billing Service
Total Revenue = Revenue generated by switching to Third Party Billing Service

Expenditures
Payroll = (% of total revenue)
Medical supplies/equipment = (% of total revenue)
1 Full Time Nurse Practitioner = average salary of 1 Full Time Nurse Practitioner
1 Full Time Physician Assistant = average salary of 1 Full Time Physician Assistant
Total Expenditures = (payroll + medical supplies/equipment + 1 Full Time Nurse Practitioner and 1 Full Time Physician Assistant)

Net Profits = Total Revenue - Total Expenditures

3.4 Break-Even Analysis

Variables to consider:

- Total Fixed Costs: The total of all costs necessary to administer care. Amount does not vary.
- Variable Unit Cost: Costs that change directly proportional to the number of services administered.
- Total Variable Cost: Total of services expected to be administered, multiplied by the variable unit cost.
- Total Cost: The sum of total fixed costs and total variable costs.
- Price per Visit: The amount charged to the patient for each individual service.
- Total Revenue: The price per visit multiplied by the potential quantity of visits.
- Forecasted Net Profit: Total revenue from services, less the total cost.

Break-Even Point:

- Number of units that must be sold in order to produce a minimum profit of zero, while picking up all related costs. The point when visits begin to generate a profit.
- Break-Even Point = Fixed Cost / (Unit Price - Variable Unit Cost)

Chapter 4: Analysis and Results

Our MQP group has chosen four different methods of analysis which would best help our goal of developing a new revenue structure plan that would help generate more revenue for the Health Services of Worcester Polytechnic Institute. The first two methods of analysis that our MQP group is conducting includes the scenario analysis and break even analysis. Upon the approval from the director of the Health Services here at Worcester Polytechnic Institute, our MQP group is allowed to review copies of the annual budget reports and income statements. We are testing and calculating our three different methods of analysis with the data from the financial reports. The third method of analysis is the survey analysis where the first part involves our MQP group creating and emailing a survey to the students that asks them several key questions regarding their opinions and concerns regarding the Health Services of Worcester Polytechnic Institute. The second part of the survey analysis is to collect all of the students' responses from the survey and analyze the results.

The last method of analysis is to research the other Health Services of other nearby colleges. Our research consists of traveling to the selected colleges and interviewing their Health Service directors. We plan on finding out how other colleges generate revenue for their Health Services as well as their financial benefits, what their budget breakdown is, the level of staff, types of services offered, pros and cons, and any concerns regarding their revenue stream model. By researching the financial benefits that come from the different types of revenue stream models that other Health Services implement, as well as the survey results and the final

calculations of financial data that we get from our analysis, our MQP group is set to present our final recommendations and business analysis plan regarding how the Health Services at Worcester Polytechnic Institute can best generate more revenue.

4.1 Survey Analysis

Conducting the survey, it was necessary to narrow down which questions would be most beneficial, and which surveying service would allow us to analyze and illustrate the data we collected from the students. First, we created a long list of questions pertinent to the topic of Health Services. We then eliminated any questions that did not pertain directly to the goals of our project, and assessing the current student opinion of Health Services. Once we created the final list of questions, we sought out a applicable surveying site that would not only allow us to collect data, but would also allow us to break it down and present it in a multitude of ways. After reviewing many websites we settled upon SurveyMonkey. The SurveyMonkey site is very straightforward, does not require any downloading, allows for easy customization, and would display the data collected in useful breakdowns, charts, and graphs. The site merely asks us to enter our questions one at a time, records them, and then gives us a URL to share with whomever we would like to take the survey.

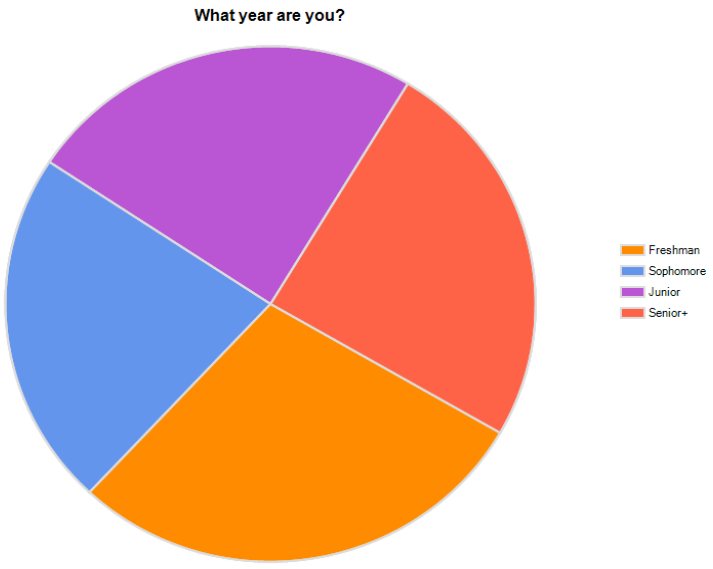
Once the survey had been completed, we sent it out to the entire student population on November 14th, and only two days later we had received over 700 responses. The responses began to die off after this point, and we decided to shut the survey down and begin analyzing the data after three days of collection.

4.1.1 Survey Summary

As previously established, one of the most beneficial methods of gathering information during our MQP project was the survey we conducted. In order to better establish a need for restructuring the Health Care Services at WPI, analyzing the feedback given by the students of

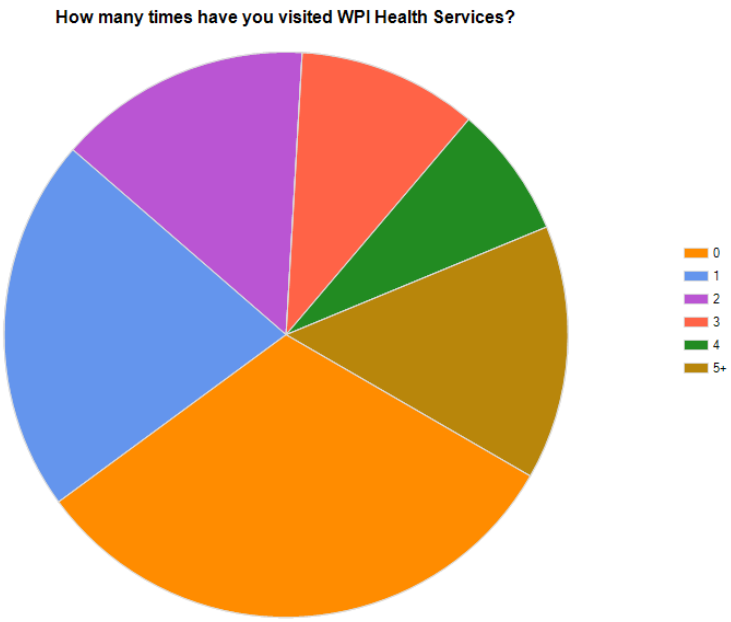
the Institute is crucial. In analyzing the data gathered we are evaluating the fourteen questions asked from various angles in order to determine what the student population feels about Health Services, as well as any changes they would like to see made to the current structure.

The first question asked in the survey was "What year are you?" This question is presented to establish an age range in the population of those taking the survey. As the figure below demonstrates, the breakdown of this question confirms that of the 734 students who took the survey, 18 percent were freshman, 115 were sophomores, 135 were juniors, and 153 were seniors or older. Knowing this information aids not only in establishing who is taking the survey, but when examined in conjunction with future questions, also allows us to determine which class of students are visiting Health Services most frequently. Furthermore, it is a positive result to see that many of those taking the survey were seniors because seniors will most likely have more of an interaction basis with Health Services over the course of their four years here, than would a freshman in their first year. Due to the strong feelings they may have developed towards Health Services over their years in college, senior students make an excellent population to get opinions from.



The second question posed to those taking the survey is "Do you suffer from a chronic or serious illness?" Asking this question establishes why a particular student may have reason to visit Health Services on a regular basis. When analyzing the data overall, students who frequent Health Services may have very valuable input as to the changes that should be made to the organization. Furthermore, these students must be taken into account when examining the total number of visits from each different class year. The Survey Monkey program we chose to use allows us to removes certain populations based on their answers, giving us the opportunity to examine different potential scenarios. On the whole, it was found that only 36 students who took the survey suffer from a chronic or serious illness, which makes examining their commentary crucial.

In asking the third question, "How many times have you visited WPI Health Services?" we are soliciting a response that will help in creating a demographic analysis of the frequency of visits to Health Services. The information received from this question is very important, because if a student has not visited Health Services, their input is not as qualified as those who frequent Health Services. In later analysis, the population of students who have never visited the WPI Health Services will be removed to see what change occurs in the cumulative analysis. The figure below demonstrates the distribution of responses from the students who responded to the survey. This is a very good spread of responses and will allow for a thorough examination of how student viewpoints change with the rise in the number of visits.



Along with questions to establish student populations, we inquired about student satisfaction with current Health Services operating processes. The fourth question in the survey is "Were you able to schedule an appointment with a physician in a timely matter?" This question aids us in better understanding of how readily available the staff working for Health Services is, and if it may be necessary to put any potentially generated revenue towards more staff members. The responses from the survey showed that 78 percent of students were able to schedule an appointment swiftly, while 22 percent felt they did not. Although this is not a huge number for those unsatisfied, it is substantial enough to consider recommending an increase in the number of staff currently employed in order to make scheduling more efficient.

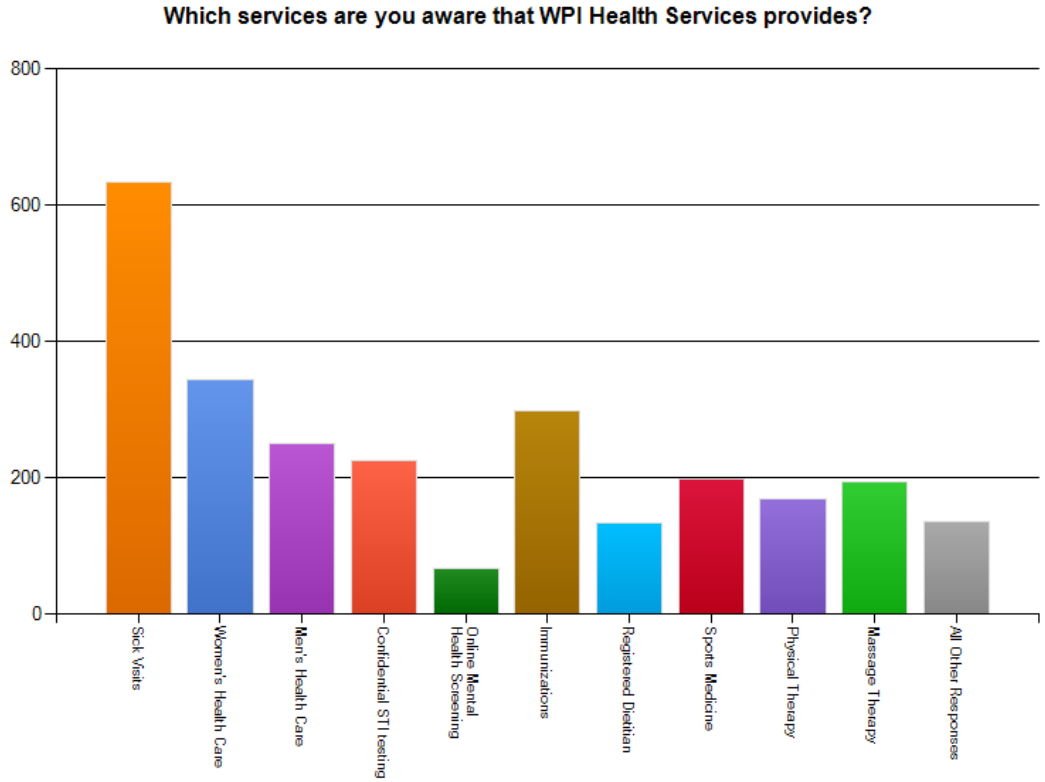
In working towards achieving the goals of our project, it was necessary to find out how knowledgeable students are about how they pay for the services they are provided. Question five, "Do you know that there is a student health fee that undergraduates are required to pay?" does just that. This question helps us understand whether or not students are looking into what they

are paying for, or if they may just assume it is something they do not pay for. In the breakdown of the question results, 72 percent of students were aware they were paying a student health fee, while 28 percent were not. These results will help in the later analysis of billing structure questions. Students who are unaware that they are even paying a student health fee may not have the most beneficial input as to whether or not the fee should be raised or lowered because they are unaware of the current model of billing. Also, students who are uninformed about the fact that they are currently paying a Health Services fee would most likely not notice if there was an increase in the fee charged towards Health Services.

Question six is a follow-up question in tangent with number five; "If you are aware that there is a student health fee, do you know how much it is?" Those of the student population who answered yes to the previous question may know they are paying a student health fee, but not how much they are paying. If a student is unaware of how much they are currently paying for the services provided for them, their insight into the distribution of funding (as asked in later questions) may be skewed. Overall, only 23 percent knew how much they were paying, while 77 percent were unaware. This is critical information showing that, indeed, many students are unfamiliar with the amount they pay for the services provided. Therefore, asking a question like "Do you feel you receive quality care for what you pay?" cannot be answered adequately by this particular student population. Again, in the future analysis, where certain populations can be removed to gain the most beneficial insight, we will see what effects removing such a population can have on the overall responses.

Moving away from financial aspects, the next question is "Which services are you aware that WPI provides?" Although Health Services offers many valuable services to students, many of these students may be unknowing of just what is accessible to them. Again, the figure below

gives an excellent breakdown in the student responses, and shows that the majority of students are mostly aware of only the basic practices, sick visits for example, that are offered by Health Services. Information like this helps in deciding if we should recommend whether or not Health Services should either cut back on the number of services they offer to students, or improve the way they publicize their services. On the whole, students should be made more aware of what options they have so they may utilize them from Health Services, rather than going off-campus to a hospital to receive treatment.



In order to get an estimate of how the general student population feels about the programs that Health Services provides, we posed the question "How satisfied are you with the extent of services that WPI Health Services provides?" Although it was shown that not many students are aware of the extent of services offered, it is important to ascertain how the population feels about

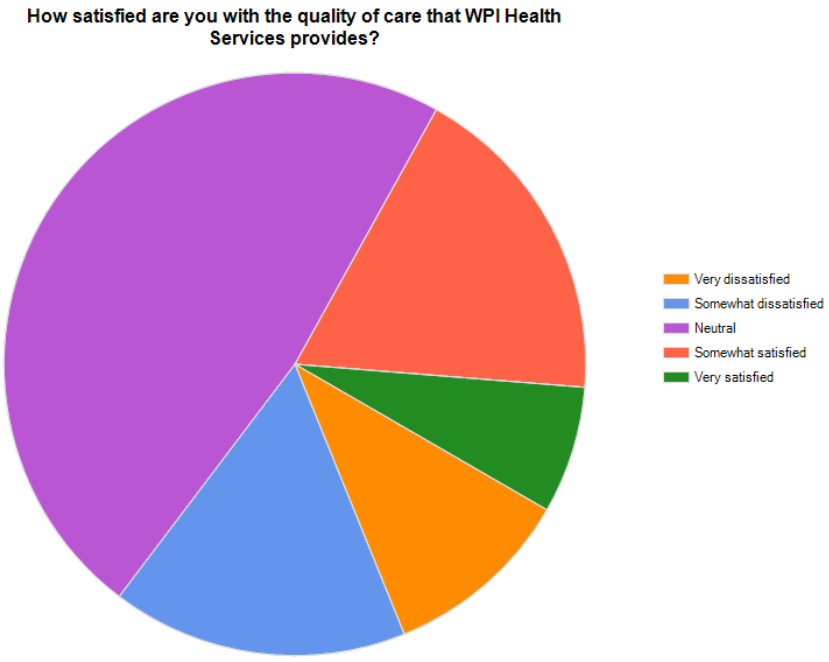
what they believe they are being offered. Generally, it was shown that most students feel impartial about what they are being offered, as 34 percent chose "neutral." Only 12 percent were found to be very dissatisfied, and 8 percent were very satisfied. The rest of the spread included 22 percent being somewhat dissatisfied and 24 percent being somewhat satisfied. This was a very even diffusion, and does not show that students feel either partial or impartial on the matter.

The tenth question was a fill-in for those taking the survey, and the students "Many other universities offer an extensive amount of diverse services to their student." This was followed by the question "What other services would you like to see WPI Health Services provide?" The bulk of answers showed that many students wanted to see programs such as yoga and Pilates offered free to students, in order to maintain a healthy lifestyle while away at college. Along the same lines, a great deal of responses would like to have programs on nutrition and positive dietary habits offered on a semi-regular basis. Furthermore, it was expressed in great numbers that students would like walk-ins to be accepted as well as sports related injuries taken care of.

After the students have read in the survey what is available to them and are now aware that they pay a student health fee for these various services, question eleven asks "Are you willing to pay a higher student health fee in order to receive more services provided by WPI Health Services?" The responses to this question will aid in the understanding of how much students want from their Health Services. A mere 18 percent of student answered "yes" to the price increase, while 82 percent responded "no." The results of this question show that although students are not completely informed of what they are being offered, they are either satisfied with the current state or are not willing to pay more for new services. More information can be gained from this question when other populations, such as those who were not aware that they paid a student health fee, are removed and the question is reexamined. When more relevant

populations are taken into consideration, it will help gain more accurate viewpoints and opinions of whether or not student know what they are truly being offered by Health Services.

The twelfth question is somewhat of an accumulation of all previous question because it asks “How satisfied are you with the quality of care that WPI Health Services provides?” The feedback from this question does not pertain to any specific aspect of WPI Health Services, but rather asks how students feel about the overall quality of the treatment they have received. This is another question that will be further analyzed through different population means to examine how those who have visited Health Services feel about the quality of care given by the employees. The figure below shows the distribution of student satisfaction or dissatisfaction with the currently implemented structure and workings of Health Services and its staff. Analogous to the results from the previous satisfaction question, the distribution leans mostly towards an impartial feeling, with an otherwise even allocation of percentages.



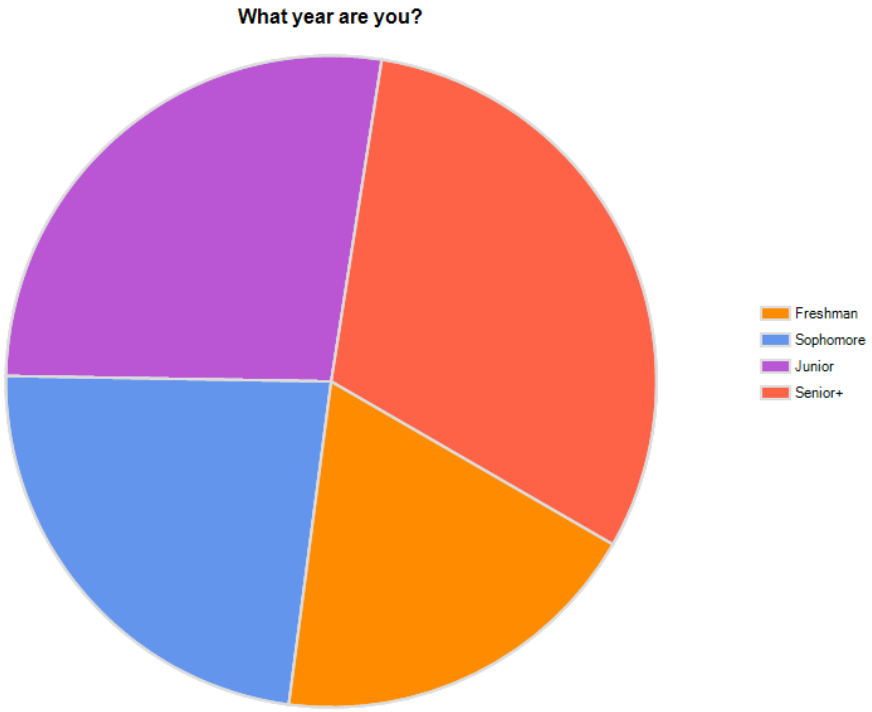
Gaining information on why students may or may not visit Health Services is vital to understanding whether or not any revenue generated should be allocated towards changing or boosting the currently implemented structure. Question thirteen is meant to set up an idea of how many students still use their home physician. It was determined that 87 percent still use their home physician, while 13 do not. This does not necessarily mean that those who responded "yes" do not utilize health services, but rather may still use their physician as their means of primary care.

The final question asked, "If you do still visit your home physician, what can WPI Health Services do to attract you to utilize their services instead?" Many students responded that when they are home they use their physician, but when they are at school they use the campus Health Services. However, a great deal of those who responded expressed that they would like to see better employees working in Health Services, as well as better diagnosis across the board. Many students stated that they were either told that what they were suffering from was not serious, or were misdiagnosed as having an incorrect ailment. Finally, a great deal of students simply wanted Health Services to make it more obvious to students what programs they offer, and to publicize these services more prominently across campus and to students.

4.1.2 Survey Filter: Removal of those who have never visited Health Services

In order to get more accurate, and valuable, feedback we removed the student population who had never visited health services. We removed these students because many questions focus on how the student feel about how Health Services is currently run and if a student has never visited the office, they cannot give proper commentary. The following is a reconstruction of many of the survey questions, but with results not including those students who have never utilized Health Services; the response number is now 498, which is a drop of 236 students.

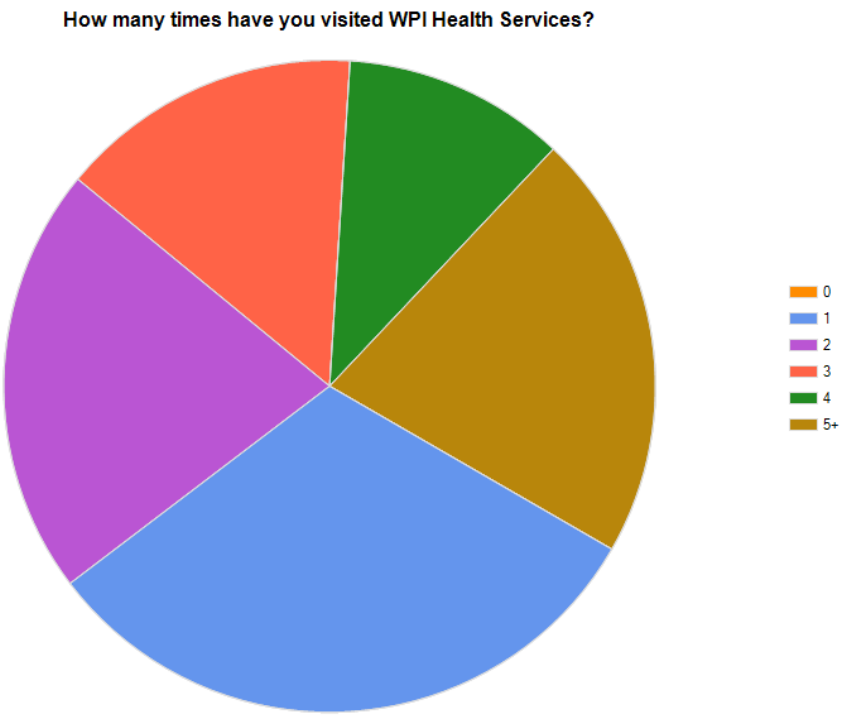
The reconstruction of the survey showed that the population was comprised of 19 percent freshmen, 23 percent sophomores, 27 percent juniors, and 31 percent seniors. This is a positive sign because seniors have been in the school system for four years and may have utilized health services the most over the course of their four years here; meaning they will have much insight to give on the changes that should be made.



Question two, which asks about the international student population now shows that 7 percent of students are international, and 93 percent are not. Again, this is important because international students do not have the option of using their home physician to meet their medical needs, and most likely use Health Services as their primary care administration. This population is a positive aspect for later questions that ask for commentary on how things could be altered. In response to question three, only 10 percent of the students who have previously visited Health

Services have a chronic or serious illness that they are currently suffering from, whereas 90 percent do not.

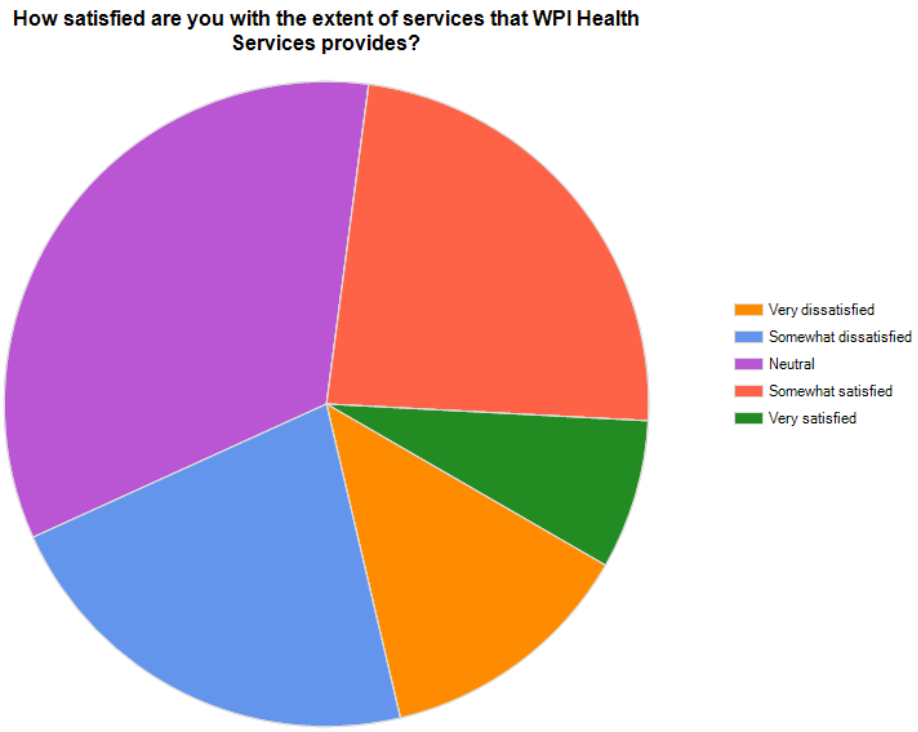
The fourth question now projects that of 498 students in the new population, 31 percent of students have visited health services once, 21 have visited twice, 15 three times, 11 four times, and 21 percent have visited five or more times. The spread of responses to this question is of good quality because it will give many different perspectives. Also, over one hundred of the students who responded have visited health services five or more times which means they can have very accurate and useful suggestions and responses to the opinionated questions. Furthermore, of these students, 78 percent found they could schedule an appointment at Health Services in a timely manner, and 22 percent did not.



In response to the questions regarding the Health Services fee, 71 percent of students was aware they paid a student health fee and 29 were unaware. In addition, 112 percent of students

knew how much the fee was and 370 did not. This is an interesting comparison to the unfiltered survey response in which 499 students were aware they paid a fee, and 222 were not. This shows that 110 of those students who had never visited Health Services were also unaware they paid a fee for the service provided.

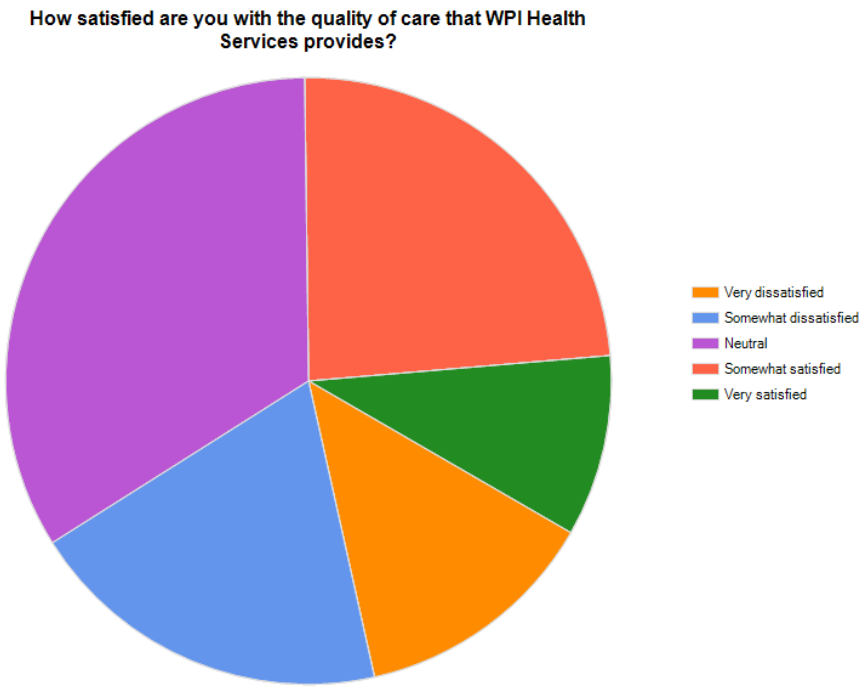
A crucial question to gain information from is number nine, which asks about the student's satisfaction with the current Health Services structure. The figure below shows the demographic response outlay of student satisfaction with Health Services. This is a very similar response layout as the unfiltered section shows, meaning that across the board most students feel neutral about the amount of services they are offered. This feeling of neutrality, however, may come from a lack of awareness as to what they are being offered.



Similar to the previous responses, without the zero visit population removed, students wanted to see some sort of athletic assistance offered by Health Services, for non varsity athletes. Those who are in club sports or intramural sports do not get treated by the athletic training staff, but still suffer from many of the same injuries. Also, student would still like to see on-site X-Rays as well as dental services.

Considering the information gathered from the previous question, number eleven asks whether or not students would be willing to pay a higher student health fee in order to receive any new service, such as those suggested above. Although there were 176 written responses, the vast majority of which desired new programs, only 85 students were willing to pay more to see new programs and 398 would not. The comparison of these responses is misleading because they suggest that students desire new programs and changes, but are unwilling to pay to see them implemented.

Additionally, question twelve asks how satisfied the students are with the overall quality of care offered by the WPI Health Services. Again, the figure below shows the breakdown of student responses to this question. On the whole, this information shows that only 33 percent of students who visited health services were dissatisfied with the treatment they were administered. Also, of these students who responded 422 still utilized their home physician and 63 did not.



Finally, it was asked what changes could be made to Health Services to make students visits on a more regular basis, rather than using their home physician. Largely, there were three main desires expressed by students. Students responded that they wanted walk-ins to be available because students with serious ailments should not have to wait, potentially for days, before they were seen by Health Services. Secondly, students wanted to see the hours of Health Services extended because they felt the hours were not conducive to when students needed to be seen most by the care givers. Finally, many students requested to see a doctor, rather than a nurse practitioner, and to have the doctor be available on a regular basis so they did not have to constantly explain their medical history to a different staff member.

4.1.3 Survey Analysis and Conclusions

Overall, the survey results indicate that a viable percentage of the student population has opinions and concerns regarding Health Services at WPI. The responses to the survey reveal that

a majority of these students responding are seniors that have previously visited Health Services. The project benefits greatly from this finding because the information given by seniors reflects four years of experience, allowing us to create a more accurate representation of the total student population's feelings towards the services. Furthermore, if all underclassmen are removed from the population, and only seniors are taken into account, the responses to the fill-in questions remain high and the trending in satisfaction leans towards dissatisfaction. This allows us to assume that senior students, who have had the most amount of time to utilize Health Services, are unhappy with the structure. When the other populations are singled-out and their responses are a analyzed, they show an overall trend of neutrality towards the services. Many of the underclassmen also did not take the opportunity to write-in responses about the services offered by Health Services.

The trending in responses also showed that most students have only visited Health Services one time, meaning they only have one experience to formulate an opinion on. When considering changes, this fact needs to be taken into account and one-time responses are given less weight than those students who have visited five or more times. Students who have visited Health Service five or more times expressed that they would like to see many changes made, ranging from new staff to a better facility. This information promotes the need of a revenue generating structure for Health Services, so improvements to the building and equipment can be made. Furthermore, the overwhelming number of responses indicating a desire for more, or better, staffing, promotes the need for more revenue.

Only 72% of the student who responded were aware that they were paying a student health fee, and only 23% of those who answered "yes" knew how much the fee was. This means that if there were to be an increase in the student health fee, many students would not be aware of

the increase. However, if there were to be a fee-for-service structure implemented, all students who visited Heath Services would be aware they now have to pay to receive different services. This is important to consider when determining which structure would be best to implement. If the health service fee were to be lowered and a fee-for-service added, t would most likely need to explained to each student that the overall fee they pay was lowered but they must now pay for each treatment they receive. Furthermore, many students would be inclined to express unhappiness with an out-of-pocket expense.

In analyzing the data, it is revealed that according to student responses; many students are not aware of all the services offered, most students would like to see more services offered, but a large percentage of students expressed that they would not like to pay more to see new services put forward. This creates a dilemma of sorts because students want to see change, but are not willing to pay to see the changes implemented. However, because many students are not aware of what services are offered, but expressed a desire for better staffing, suggests that any money generated should go towards hiring more or new staff members.

On the whole, analyzing the survey results shows that students have a neutral feeling towards Health Services, and would like to see changes made to the staffing before seeing new programs implemented.

4.2 Health Services of Nearby Colleges

One method of analysis that our MQP group is conducting is to research the Health Services of nearby colleges. The most important goal of this analysis is to find out what their revenue stream model is and how it benefits their Health Services as well as how it might benefit the Health Services of Worcester Polytechnic Institute. Other topics that our MQP group feels would help the decision-making process for our project is finding out the financial benefits, the

budget breakdown, level of staff, types of services provided, pros and cons, as well as any other concerns regarding the revenue stream model of other Health Services.

The first step of this analysis is to come up with a list of potential colleges that we felt was crucial to our project. After finalizing the list of colleges, we selected a total of six colleges which are all located in Massachusetts. Each of these six colleges has Health services that implemented different revenue stream models. These six colleges are not named in our paper for privacy reasons. We then scheduled an appointment with the directors of these Health Services to interview them via in person or over the telephone. The list of questions that our MQP group created in order to interview the directors of the Health Services can be found in Appendix A.

College Letter	School Population	Structure	Amount Received	Staff Number	Service Population	Positive/Negative Feedback
A	2200 undergraduates	Fees for Service (UMass Contract)	Undisclosed	7 (Part-Time)	Undergraduates	Neutral
B	6,409 undergraduates and 749 graduates	Student Health Fees and Third Party Billing	$95 per year	15	Undergraduates and Graduates	Positive
C	1200 undergraduates	Student Health Fee	Undisclosed	3	Undergraduates	Negative
D	4,800 undergraduates and 1,500 graduates	Student Health Fee	$650 (80%)	30	Undergraduates and Graduates	Positive
E	3,500 undergraduates	Student Health Fee	$80 per year	5	Undergraduates	Positive
F	2728 undergraduates	Student Health Fee (UMass Contract)	$284 per year	7	Undergraduates	Positive

Table 4. Summary of college interview information.

4.2.1 College A

The Health Services staff at this college consists of two nurse practitioners, two nurses, two sectaries, and a total of four physicians. The four physicians work a total of 20 hours a week combined. Each physician works only one day a week and there is never more than one physician on site per day. The entire staff at this health service is part time. All counseling services, lab, and blood work is all housed in the Health Services building.

The Health Services at this college treats only full-time undergraduate, graduate, and part-time students. Around 3800 students visited the Health Services center during the 2010-11 school year. There are currently 2200 full-time undergraduate students enrolled at this college. The undergraduate students do not pay any student health fees or fees for service but are charged an undisclosed amount of money that is hidden in their tuition bill. Graduate students, on the other hand, have to pay fees for service. The majority of the Health Services' budget comes from the students' tuition bill.

Currently, this college implements an annual service contract with UMass where they provide the medical staff needed to work at Health Services. The entire medical staff at the Health Services center is made up of UMass employees. Since the service contract with UMass is year to year, the college has the option of switching to an alternative business plan. If that was to happen, then the current staff would no longer be employed to work at this college. The college has not always had a service contract with UMass. Before UMass, the college had a service contract with Hamon. In order to cut costs, the president of the college decided to switch to UMass.

Health Services at this college operates on a break-even budget and is very limited. 95% of the Health Services budget is allocated towards paying the salaries of the medical staff. As of

now, the director of the Health Services center feels that there is not sufficient funding to meet their needs. Due to the limited budget, the director cannot hire any more staff. The president of the college is currently considering charging undergraduate students a fee-for-service in order to generate more revenue for Health Services. A complete interview protocol can be found in Appendix B.

4.2.2 College B

College B is a large University with a population of 6,409 undergraduate and 789 graduate students. Their staff entails employees that are full-time for 9 months and full-time for 12 months. The doctor that is on-site is a contracted employee while the other employees are benefited or per diem. College B serves both undergraduate and graduate students. Last year 5,100 students were seen at Health Services.

The revenue stream structure for College B is a combination of student health fees and third party billing. The student health fee is $47.50 per semester and their third party billing company is Viviture. Once third party billing was implemented in 2007 College B's budget has been increasing. They were able to remodel their Health Services building and increase their employees' salaries. Even though 60 % of the Health Services budget goes to paying for salaries, College B is pleased with their revenue structure. They feel that with the help of third party billing their need to prevent a deficit has been met over the years. Also noted by the director was that to switch third party billing would depend on the number of students that are enrolled. A full interview protocol can be found in Appendix C.

4.2.3 College C

The Health Services staff at College C consists of one nurse practitioner/director, one physician, and one counselor. The nurse practitioner/director works throughout the entire day while the physician only works in the mornings. On average, the nurse practitioner/director has

appointments with roughly 20-30 students a day at Health Services. Only undergraduate students are allowed to go to Health Services for treatment. There are currently 1200 full-time students enrolled at this college. The students here do not have to pay any student health fees or fees-for-service but are charged an undisclosed amount of money that is hidden in their tuition bill. The majority of the health services' budget comes from the students' tuition bill.

Currently, Health Services does not generate any revenue. The nurse practitioner/director feels that Health Services do not receive sufficient funding to meet their needs and do not have sufficient staff members. Thanks in large part to not generating any revenue; the college cannot add any more staff members at Health Services. When asked about the idea of implementing a third party billing system as a way to generate revenue for this college, the nurse practitioner/director implied that the college was not big enough or had the required staff members to handle it. A complete interview protocol can be found in Appendix D.

4.2.4 College D

In interviewing College D, we were able to gain a lot of knowledge on how a college of similar size can operate at optimum performance. We learned that their budget comes from a student health fee of $650 annually, of which they receive 80%. The rest of their budget is received from the lab work that they send out. This is how they are able to sustain 29 staff members as well as offer a plethora of services to their students. The director is extremely pleased with the structure they are using and the services that they are able to provide. She is responsible for her budget and is able to make decisions at her own discretion. When we asked the director her opinion on third-party billing, she informed us that she believes that it is extremely difficult to implement this type of structure at a school of our size. She also advised

us to take into consideration if students are still seeing their home physician. A full Interview Protocol on College D can be found in Appendix E.

4.2.5 College E

College E has a small population of roughly 3,500 students. This small population allows them to have a limited staff population, and still be able to adequately serve the student populace. College E has one full-time nurse practitioner, who also serves as their director, two part-time nurse practitioners, one full-time administrative assistant, and one full-time clerical assistant. A nurse practitioner will serve to administer routine examinations, physicals, and other non-specified medical services provided by Health Services; more specified services, such as gynecological exams, are done by medical professionals trained in that area. The administrative assistant serves to retrieve, organize, and distribute information to the Health Services staff. A clerical assistant specializes in telecommunications and working with the organization of computer data. Although College E is a small college, Health Services see approximately 2,000 students a year. All of which are undergraduate students, as College E does not serve graduate students or professors.

College E has a student health fee of $80 a year or, for part-time students, a fee of $3.40 per credit hour. Compared to other small colleges, this is a minimal health services fee. Furthermore, College E is under contract with a hospital, which provides students to work some positions at College E. This revenue structure and contract have been around for the past 15 years, and prior to their installation College E had only one full-time nurse working in Health Services. Currently, the college breaks-even in revenue, but if there is a surplus it is put into a trust fund for future use by Health Services. Overall, College E is satisfied with the current revenue structure, but is considering third-party billing as a future option.

According to College E the students seem happy, and satisfaction surveys are both given to students who have visited health services, and sent out to the general population. If there would be one change made to the current programs, College E would like to hire a nutritionist and psychiatrist.

4.2.6 College F

College F is a very small-scale college, with a population of nearly 2,800 students, all of whom are undergraduates. This population size is much more comparable to the WPI campus population than the majority of larger colleges in the area. From August 1st, 2010 to May 13th, 2011, College F's Health Services saw approximately 4,499 students. This number is distributed between visits to the medical director, nurse practitioners, and registered nurses. College E currently employs two nurse practitioners, one of whom is also the director, that work 30 hours a week for 40 weeks per year. The college also employs two registered nurses, one who works as a clinical coordinator for 40 hours per week for 48 weeks per year, and the other who works for 40 hours a week for 42 weeks per year. There are two physicians on staff, each working 20 hours per week, and one administrative assistant who works 40 hours per week year round.

The revenue structure implemented at College F is a Student Health Fee of $284 per year, with separate lines implemented for funding towards salaries, supplies, equipment, and travel expenses. This separation of lines allows for a more precise budget outline of expenses, and creates less confusion if a need for more money should arise. The director finds no major issues with the current structure, and is pleased with the current staff size or funding. Although the director is pleased with the structure, they have done the benchmarking for third party billing and its benefits, and are considering it as a potential future option.

College F sends out satisfaction surveys to patients after they visit, and also sends out surveys to the general student population. However, they have found a low return rate, and attribute it to the overload of e-mails sent to students. A full interview protocol can be found in Appendix G.

4.3 Scenario Analysis

The scenario analysis is one of the four different methods of analysis that our MQP group is conducting that will best help us develop a new revenue structure plan that would help generate more revenue for the Health Services. Currently, the director of the Health Services here at Worcester Polytechnic Institute is looking to add either one full time nurse practitioner, or one full time nurse practitioner and one full time physicians' assistant to her medical staff as a way to help improve the level of constant quality care that the students at this college are in desperate need of. Unfortunately, the director cannot make either of these two moves due to the limited budget that she currently receives from the college administration. By analyzing different scenarios with the use of the three different types of structure options mentioned earlier in section 2.5, student health fees, fees for service, and third party billing, our MQP group can determine the best business analysis plan that would help generate the amount of revenue that is required to add either the one full time nurse practitioner or one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff.

Our scenario analysis section contains a total of 5 different scenarios which are as follows:

SCENARIO 1A: Increasing student health fees to hire 1 full time nurse practitioner.

SCENARIO 1B: Implement fees for service to hire 1 full time nurse practitioner.

SCENARIO 2A: Increasing student health fees to hire 1 full time nurse practitioner and 1 full time physicians' assistant.

SCENARIO 2B: Implementing fees for service to hire 1 full time nurse practitioner and 1 full time physicians' assistant.

SCENARIO 3: Switching to third party billing to hire either 1 full time nurse practitioner, or 1 full time nurse practitioner and 1 full time physicians' assistant.

Before we begin to analyze the different scenarios, our MQP group will first calculate how much money is given to the budget of the Health Services here at Worcester Polytechnic Institute for the 2011-2012 academic school year by the college administration. The Health Services currently receives about 39% of the total revenue from the student health fees for their budget. The total revenue of the student health fees comes from multiplying the number of enrolled students by the cost of the student health fee. Currently there are 3,746 enrolled students at Worcester Polytechnic Institute for the 2011-2012 academic school year. By multiplying 3,746 by the cost of the student health fee which is currently $320.00, the total revenue from the student health fees for the 2011-2012 academic school year comes out to $1,198,720.00. To determine how much of the total revenue from the student health fees the Health Services actually receives for their budget, just multiply $1,198,720.00 by 39% which will result in a total of $469,500.80. After the director of the Health Services has been given the budget, she uses 60% ($280,500.48) of the funds to pay the salary of the staff while the other 40% ($187,000.32) goes to the purchasing of medical equipment and supplies. These calculated numbers are shown in Table 5 below.

	Current Health Services Revenue Budget
Student Health Fee	$320.00
Number of Enrolled Students	3,746
Total Revenue of Student Health Fees	$1,198,720.00
Percentage of Total Revenue of Student	39%

Health Fee given to Health Services	
Total budget for Health Services	$467,500.80
Amount of funds available in the Health Service budget to pay salary of staff	$280,500.48
Amount of funds available in the Health Service budget to purchase medical eq. and supplies	$187,000.32

Table 5: Current Health Services Revenue Budget

4.2.1 Scenario 1A: Increasing student health fees to hire one full time nurse practitioner.

As of November 2011, according to the director of the Health Services here at Worcester Polytechnic Institute, "The salary of one full time nurse practitioner at Worcester Polytechnic Institute is $68,000." Our MQP group will first increase the cost of student health fees by $50.00 to determine whether or not there will be enough revenue in the Health Services' budget to cover the costs of adding one full time nurse practitioner to the staff. If that amount is not enough, we will then increase the student health fee by $60, $70, $80, $90 and so on until Health Services has enough revenue in their budget to cover the costs of adding one full time nurse practitioner to the staff.

Scenario 1A				
	Increasing Student Health Fees by $50.00	**Increasing Student Health Fees by $60.00**	**Increasing Student Health Fees by $70.00**	**Increasing Student Health Fees by $80.00**
New Student Health Fee	$370.00	$380.00	$390.00	$400.00
Number of Enrolled Students	3,746	3,746	3,746	3,746
Total Revenue of Student Health Fees	$1,386,020.00	$1,423,480.00	$1,460,940.00	$1,498,400.00
Percentage of Total Revenue of Student Health Fee given to Health Services	39%	39%	39%	39%

Total budget for Health Services	$540,547.80	$555,157.20	$569,766.60	$584,376.00
Amount of funds available in the Health Service budget to pay salary of staff	$324,328.69	$333,094.32	$341,859.96	$350,625.60
Difference in Budget from the Current Health Services Revenue Budget from table 5	$43,828.21	$52,593.84	$61,359.48	$70,125.12
Salary of 1 Full Time Nurse Practitioner at WPI	$68,000.00	$68,000.00	$68,000.00	$68,000.00
Difference in Budget	(-$24,171.79)	(-$15,406.16)	(-$6,640.52)	$2,125.12
Enough Revenue to Hire 1 Full Time Nurse Practitioner?	NO	NO	NO	YES

Table 6: Increasing student health fees to hire one full time nurse practitioner.

Column 1 from table 6 shows whether it is feasible to hire one full time nurse to the Health Services' staff by increasing the student health fee by $50.00. First, our MQP group will calculate the total revenue of student health fees by multiplying the student health fee ($370.00) by the number of enrolled students (3,746). Second, we multiply the total revenue of student health fees ($1,386,020.00) by the percentage of total revenue of student health fee given to Health Services (39%) to get the total budget for Health Services ($540,547.80). Then we multiply the total budget for Health Services by 60% to find out the salary budget ($324,328.69). From there, our MQP group will determine whether the difference between the amounts of funds

available in the Health Service salary budget from scenario 1 and the current health services revenue budget from table 5 ($280,500.48) will be enough to cover the cost of adding one full time nurse practitioner to the Health Services' staff ($68,000.00). After the final calculations, our MQP group determined that increasing the student health fee by $50.00 does not generate enough revenue to cover the cost of adding one full time nurse practitioner to the Health Services' staff.

Column 2 from table 6 shows whether it is feasible to hire one full time nurse practitioner to the Health Services' staff by increasing the student health fee by $60.00. First, our MQP group will calculate the total revenue of student health fees by multiplying the student health fee ($380.00) by the number of enrolled students (3,746). Second, we multiply the total revenue of student health fees ($1,423,480.00) by the percentage of total revenue of student health fee given to Health Services (39%) to get the total budget for Health Services ($555,157.20). Then we multiply the total budget for Health Services by 60% to find out the salary budget ($333,094.32). From there, our MQP group will determine whether the difference between the amounts of funds available in the Health Service salary budget from scenario 2 and the current health services revenue budget from table 5 ($280,500.48) will be enough to cover the cost of adding one full time nurse practitioner to the Health Services' staff ($68,000.00). After the final calculations, our MQP group determined that increasing the student health fee by $60.00 does not generate enough revenue to cover the cost of adding one full time nurse practitioner to the Health Services' staff.

Column 3 from table 6 shows whether it is feasible to hire one full time nurse practitioner to the Health Services' staff by increasing the student health fee by $70.00. First, our MQP group will calculate the total revenue of student health fees by multiplying the student health fee

($390.00) by the number of enrolled students (3,746). Second, we multiply the total revenue of student health fees ($1,460,940.00) by the percentage of total revenue of student health fee given to Health Services (39%) to get the total budget for Health Services ($569,766.60). Then we multiply the total budget for Health Services by 60% to find out the salary budget ($341,859.96). From there, our MQP group will determine whether the difference between the amounts of funds available in the Health Service salary budget from scenario 3 and the current health services revenue budget from table 5 ($280,500.48) will be enough to cover the cost of adding one full time nurse practitioner to the Health Services' staff ($68,000.00). After the final calculations, our MQP group determined that increasing the student health fee by $70.00 does not generate enough revenue to cover the cost of adding one full time nurse practitioner to the Health Services' staff.

Column 4 from table 6 shows whether it is feasible to hire one full time nurse practitioner to the Health Services' staff by increasing the student health fee by $80.00. First, our MQP group will calculate the total revenue of student health fees by multiplying the student health fee ($400.00) by the number of enrolled students (3,746). Second, we multiply the total revenue of student health fees ($1,498,400.00) by the percentage of total revenue of student health fee given to Health Services (39%) to get the total budget for Health Services ($584,376.00). Then we multiply the total budget for Health Services by 60% to find out the payroll ($350,625.60). From there, our MQP group will determine whether the difference between the amounts of funds available in the Health Service salary budget from scenario 4 and the current health services revenue budget from table 5 ($280,500.48) will be enough to cover the cost of adding one full time nurse practitioner to the Health Services' staff ($68,000.00). After the final calculation, our

MQP group determined that increasing the student health fee by $80.00 does generate enough revenue to cover the cost of adding one full time nurse practitioner to the Health Services' staff.

4.3.2 Scenario 1B: Implement fees for service to hire one full time nurse practitioner.

In scenario 1B, our MQP group is determining whether the total revenue generated from implementing a fee for service charge will be enough to cover the costs of adding one full time nurse practitioner ($68,000.00) to the Health Services' staff. Only the students who visit the Health Services at Worcester Polytechnic Institute for medical care and treatment will be charged with paying the fee for service cost. Keep in mind that all enrolled students at Worcester Polytechnic Institute for the 2011-2012 academic school year must pay a mandatory student health fee of $320.00 regardless of whether or not they visit the Health Services. In this scenario, the Health services would receive 100% of the total revenues generated from the fees for service charge. So the total budget of the Health Services would consist of the total revenues from the fees for service (100%) and the student health fees (39%).

To analyze Scenario 1B and later Scenario 2B, our MQP group will first determine the number of visits that the Health Services might encounter during this 2011-2012 academic school year which will then be used in our calculation to find the total revenue generated by implementing fees for service. As you can see, in Figure 7, the dark blue bars in the graph represent the number of enrolled students at Worcester Polytechnic Institute while the light blue bars represent the number of visits to the Health Services during that same academic school year. Since our MQP group is using the student enrollment numbers from the 2011-2012 academic school year (3,746) as our base number for the entire scenario analyses in our MQP research paper, we then need to calculate the predicted number of visits to Health Services for the 2011-2012 academic school year as well. To calculate the predicted number of student visits to Health Services for the 2011-2012 academic school year, our MQP group averaged the number of visits

to the Health Services starting from the year 2000 to 2010. These numbers are shown below in Table 7. Our calculations showed that there was an average of 3,342 visits to the Health Services during the past ten years at Worcester Polytechnic Institute. For analysis of scenario 1B and 2B, which is to determine whether or not there is enough funds generated by implementing fees for service to cover the costs of adding either one full time nurse practitioner or one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff, our MQP group will be using 3,342 as the number of visits to the Health Services for the 2011-2012 academic school year.

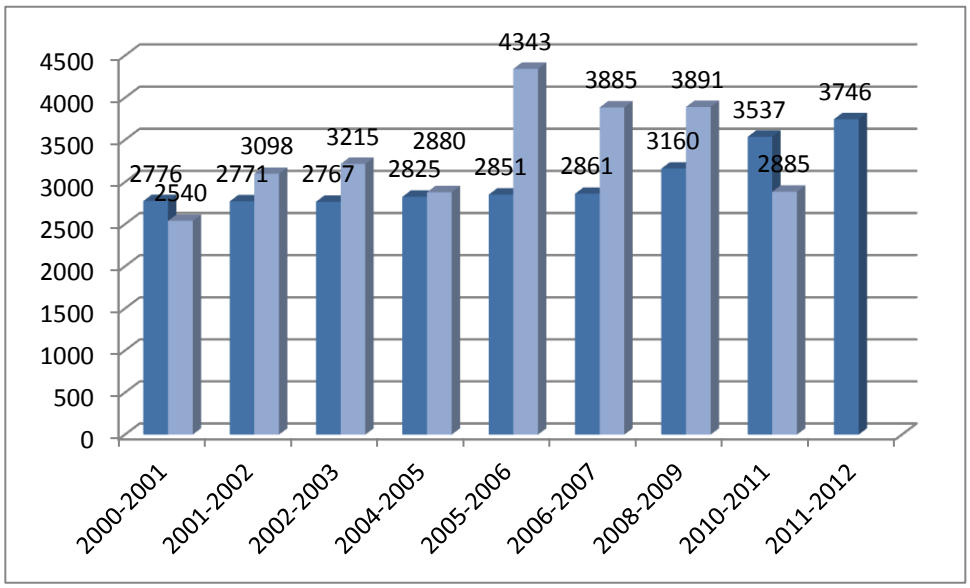


Figure 7: Breakdown of student enrollment and visits to Health Services

Academic School Year	Number of Enrolled Students	Number of Visits to the Health Services
2000-2001	2776	2540
2001-2002	2771	3098

2002-2003	2767	3215
2004-2005	2825	2880
2005-2006	2851	4343
2006-2007	2861	3885
2008-2009	3160	3891
2010-2011	3537	2885
Average	2943	3342

Table 7: Average number of visits to the Health Services

After calculating the number of visits to the Health Services, our MQP group can then determine whether a fee for service charge of $10.00 will generate enough revenue in the Health Services' budget to cover the costs of adding one full time nurse practitioner to the staff. If that amount is not enough, we will then increase the fee for service charge by $15, $20, $25, $30 and so on until Health Services generates enough revenue in their budget to cover the costs of adding one full time nurse practitioner to the staff.

Scenario 1B				
	Adding a Fee for Service of $10.00	**Adding a Fee for Service of $15.00**	**Adding a Fee for Service of $20.00**	**Adding a Fee for Service of $25.00**
Number of Visits to Health Services	3342	3342	3342	3342
Total Revenue of Fee for Service	$33,420.00	$50,130.00	$66,840.00	$83,550.00
Average Salary of 1 Full Time Nurse Practitioner at WPI	$68,000.00	$68,000.00	$68,000.00	$68,000.00
Difference in Budget	(-$34,580.00)	(-$17,870.00)	(-$1,160.00)	$15,550.00
Enough Revenue to Hire 1 Full Time Nurse?	NO	NO	YES	YES

Table 8: Implementing fees for service to hire one full time nurse practitioner.

Column 1 from table 8 shows whether it is feasible to hire one full time nurse practitioner to the Health Services' staff by implementing a fee for service cost of $10.00. First, our MQP group will calculate the total revenue of fee for service by multiplying the fee for service cost of $10.00 by the predicted number of visits to the Health Services (3,342). From there, our MQP group will determine whether the total revenue of fee for service ($33,420.00) will be enough to cover the cost of adding one full time nurse practitioner to the Health Services' staff ($68,000.00). After the final calculations, our MQP group determined that implementing a fee for service cost of $10.00 does not generate enough revenue to cover the cost of adding one full time nurse practitioner to the Health Services' staff.

Column 2 from table 8 shows whether it is feasible to hire one full time nurse practitioner to the Health Services' staff by implementing a fee for service cost of $15.00. First, our MQP group will calculate the total revenue of fee for service by multiplying the fee for service cost of $15.00 by the predicted number of student visits to the Health Services (3,342). From there, our MQP group will determine whether the total revenue of fee for service ($50,130.00) will be enough to cover the cost of adding one full time nurse practitioner to the Health Services' staff ($68,000.00). After the final calculations, our MQP group determined that implementing a fee for service cost of $15.00 does not generate enough revenue to cover the cost of adding one full time nurse practitioner to the Health Services' staff.

Column 3 from table 8 shows whether it is feasible to hire one full time nurse practitioner to the Health Services' staff by implementing a fee for service cost of $20.00. First, our MQP group will calculate the total revenue of fee for service by multiplying the fee for service cost of

$20.00 by the predicted number of student visits to the Health Services (3,342). From there, our MQP group will determine whether the total revenue of fee for service ($66,840.00) will be enough to cover the cost of adding one full time nurse practitioner to the Health Services' staff ($68,000.00). After the final calculations, our MQP group determined that implementing a fee for service cost of $20.00 does not generate enough revenue to cover the cost of adding one full time nurse practitioner to the Health Services' staff.

Column 4 from table 8 shows whether it is feasible to hire one full time nurse practitioner to the Health Services' staff by implementing a fee for service cost of $25.00. First, our MQP group will calculate the total revenue of fee for service by multiplying the fee for service cost of $25.00 by the predicted number of student visits to the Health Services (3,342). From there, our MQP group will determine whether the total revenue of fee for service ($83,550.00will be enough to cover the cost of adding one full time nurse practitioner to the Health Services' staff ($68,000.00). After the final calculations, our MQP group determined that implementing a fee for service cost of $25.00 does generate enough revenue to cover the cost of adding one full time nurse practitioner to the Health Services' staff.

4.3.3 Scenario 2A: Increasing student health fees to hire one full time nurse practitioner and one full time physicians' assistant.

As of November 2011, according to the director of the Health Services here at Worcester Polytechnic Institute, "The salary of one full time physicians' assistant at Worcester Polytechnic Institute is the same as one full time nurse practitioner. They are $68,000 each." Since the director of the Health Services here at Worcester Polytechnic Institute is looking to add one full time nurse practitioner and one full time physicians' assistant to her medical staff, the combined salary will then be $136,000.00. Our MQP group will first increase the cost of student health fees by $130.00 to determine whether or not there will be enough revenue in the Health Services'

budget to cover the costs of adding one full time nurse practitioner and one full time physicians' assistant to the staff. If that amount is not enough, we will then increase the student health fee by $140, $150, $160, $170 and so on until Health Services has enough revenue in their budget to cover the costs of adding one full time nurse practitioner and one full time physicians' assistant to the staff.

Scenario 2A				
	Increasing Student Health Fees by $130.00	**Increasing Student Health Fees by $140.00**	**Increasing Student Health Fees by $150.00**	**Increasing Student Health Fees by $160.00**
New Student Health Fee	$450.00	$460.00	$470.00	$480.00
Number of Enrolled Students	3,746	3,746	3,746	3,746
Total Revenue of Student Health Fees	$1,685,700.00	$1,723,160.00	$1,760,620.00	$1,798,080.00
Percentage of Total Revenue of Student Health Fee given to Health Services	39%	39%	39%	39%
Total budget for Health Services	$657,423.00	$672,032.40	$686,641.80	$701,251.20

Amount of funds available in the Health Service budget to pay salary of staff	$394,453.80	$403,219.44	$411,985.08	$420,750.72
Difference in Budget from the Current Health Services Revenue Budget from table 5	$113,953.32	$122,718.96	$131,484.60	$140,250.24
Average Salary of 1 Full Time Nurse Practitioner and 1 Full Time Physicians' Assistant	$136,000.00	$136,000.00	$136,000.00	$136,000.00
Difference in Budget	(-$22,046.68)	(-$13,281.04)	(-$4,515.40)	$4,250.24
Enough Revenue to Hire 1 Full Time Nurse Practitioner and 1 Full Time Physicians' Assistant	NO	NO	NO	YES

Table 9: Increasing student health fees to hire one full time nurse practitioner and one full time physicians' assistant.

Column 1 from table 9 shows whether it is feasible to hire one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff by increasing the student

health fee by $130.00. First, our MQP group will calculate the total revenue of student health fees by multiplying the student health fee ($450.00) by the number of enrolled students (3,746). Second, we multiply the total revenue of student health fees ($1,685,700.00) by the percentage of total revenue of student health fee given to Health Services (39%) to get the total budget for Health Services ($657,423.00). Then we multiply the total budget for Health Services by 60% to find out the salary budget ($394,453.80). From there, our MQP group will determine whether the difference between the amounts of funds available in the Health Service salary budget from column 1 and the current health services revenue budget from table 5 ($280,500.48) will be enough to cover the cost of adding one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff ($136,000.00). After the final calculations, our MQP group determined that increasing the student health fee by $160.00 does not generate enough revenue to cover the cost of adding one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff.

Column 2 from table 9 shows whether it is feasible to hire one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff by increasing the student health fee by $140.00. First, our MQP group will calculate the total revenue of student health fees by multiplying the student health fee ($460.00) by the number of enrolled students (3,746). Second, we multiply the total revenue of student health fees ($1,723,160.00) by the percentage of total revenue of student health fee given to Health Services (39%) to get the total budget for Health Services ($672,032.40). Then we multiply the total budget for Health Services by 60% to find out the salary budget ($403,219.44). From there, our MQP group will determine whether the difference between the amounts of funds available in the Health Service salary budget from column 2 and the current health services revenue budget from table 5 ($280,500.48) will be

enough to cover the cost of adding one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff ($136,000.00). After the final calculations, our MQP group determined that increasing the student health fee by $160.00 does not generate enough revenue to cover the cost of adding one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff.

Column 3 from table 9 shows whether it is feasible to hire one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff by increasing the student health fee by $150.00. First, our MQP group will calculate the total revenue of student health fees by multiplying the student health fee ($470.00) by the number of enrolled students (3,746). Second, we multiply the total revenue of student health fees ($1,760,620.00) by the percentage of total revenue of student health fee given to Health Services (39%) to get the total budget for Health Services ($686,641.80). Then we multiply the total budget for Health Services by 60% to find out the salary budget ($411,985.08). From there, our MQP group will determine whether the difference between the amounts of funds available in the Health Service salary budget from column 3 and the current health services revenue budget from table 5 ($280,500.48) will be enough to cover the cost of adding one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff ($136,000.00). After the final calculations, our MQP group determined that increasing the student health fee by $160.00 does not generate enough revenue to cover the cost of adding one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff.

Column 4 from table 9 shows whether it is feasible to hire one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff by increasing the student health fee by $160.00. First, our MQP group will calculate the total revenue of student health

fees by multiplying the student health fee ($480.00) by the number of enrolled students (3,746). Second, we multiply the total revenue of student health fees ($1,798,080.00) by the percentage of total revenue of student health fee given to Health Services (39%) to get the total budget for Health Services ($701,251.20). Then we multiply the total budget for Health Services by 60% to find out the salary budget ($420,750.72). From there, our MQP group will determine whether the difference between the amounts of funds available in the Health Service salary budget from column 4 and the current health services revenue budget from table 5 ($280,500.48) will be enough to cover the cost of adding one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff ($136,000.00). After the final calculations, our MQP group determined that increasing the student health fee by $160.00 does generate enough revenue to cover the cost of adding one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff.

4.3.4 Scenario 2B: Implement fees for service to hire one full time nurse practitioner and one full time physicians' assistant.

In scenario 2B, after our MQP group has averaged the number of visits to the Health Services, we will determine whether the total revenue generated from implementing a fee for service charge will be enough to cover the costs of adding one full time nurse practitioner and one full time physicians' assistant ($136,000.00) to the Health Services' staff. Only the students who visit the Health Services at Worcester Polytechnic Institute for medical care and treatment will be charged with paying the fee for service cost. Keep in mind that all enrolled students at Worcester Polytechnic Institute for the 2011-2012 academic school year must pay a mandatory student health fee of $320.00 regardless of whether or not they visit the Health Services. In this scenario, the Health services would receive 100% of the total revenues generated from the fees for service charge. So the total budget of the Health Services would consist of the total revenues

from the fees for service (100%) and the student health fees (39%). Our MQP group will first determine whether a fee for service charge of $25.00 will generate enough revenue in the Health Services' budget to cover the costs of adding one full time nurse practitioner and one full time physicians' assistant to the staff. If that amount is not enough, we will then increase the fee for service charge by $30, $35, $40, $45 and so on until Health Services generates enough revenue in their budget to cover the costs of adding one full time nurse practitioner and one full time physicians' assistant to the staff.

	Scenario 2B			
	Adding a Fee for Service of $30.00	**Adding a Fee for Service of $35.00**	**Adding a Fee for Service of $40.00**	**Adding a Fee for Service of $45.00**
Predicted Number of Visits to Health Services	3342	3342	3342	3342
Total Revenue of Fee for Service	$100,260.00	$116,970.00	$133,680.00	$150,390.00
Average Salary of 1 Full Time Nurse Practitioner and 1 Full Time Physicians' Assistant	$136,000.00	$136,000.00	$136,000.00	$136,000.00
Difference in Budget	(-$35,740.00)	(-$19,030.00)	(-$2,320.00)	$14,390.00
Enough Revenue to Hire 1 Full Time Nurse Practitioner and 1 Full Time Physicians' Assistant	NO	NO	NO	YES

Table 10: Implementing fees for service to hire one full time nurse practitioner and one full time physicians' assistant.

Column 1 from table 10 shows whether it is feasible to hire one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff by implementing a fee for service cost of $30.00. First, our MQP group will calculate the total revenue of fee for service by multiplying the fee for service cost of $30.00 by the number of student visits to the Health Services (3,342). From there, our MQP group will determine whether the total revenue of fee for service ($100,260.00) will be enough to cover the cost of adding one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff ($136,000.00). After the final calculations, our MQP group determined that implementing a fee for service cost of $30.00 does not generate enough revenue to cover the cost of adding one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff.

Column 2 from table 10 shows whether it is feasible to hire one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff by implementing a fee for service cost of $35.00. First, our MQP group will calculate the total revenue of fee for service by multiplying the fee for service cost of $35.00 by the number of student visits to the Health Services (3,342). From there, our MQP group will determine whether the total revenue of fee for service ($116,970.00) will be enough to cover the cost of adding one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff ($136,000.00). After the final calculations, our MQP group determined that implementing a fee for service cost of $35.00 does not generate enough revenue to cover the cost of adding one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff.

Column 3 from table10 shows whether it is feasible to hire one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff by implementing a fee for service cost of $40.00. First, our MQP group will calculate the total revenue of fee for

service by multiplying the fee for service cost of $40.00 by the number of student visits to the Health Services (3,342). From there, our MQP group will determine whether the total revenue of fee for service ($133,680.00) will be enough to cover the cost of adding one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff ($136,000.00). After the final calculations, our MQP group determined that implementing a fee for service cost of $40.00 does not generate enough revenue to cover the cost of adding one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff.

Column 4 from table 10 shows whether it is feasible to hire one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff by implementing a fee for service cost of $45.00. First, our MQP group will calculate the total revenue of fee for service by multiplying the fee for service cost of $45.00 by the number of student visits to the Health Services (3,342). From there, our MQP group will determine whether the total revenue of fee for service ($150,390.00) will be enough to cover the cost of adding one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff ($136,000.00). After the final calculations, our MQP group determined that implementing a fee for service cost of $35.00 does generate enough revenue to cover the cost of adding one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff.

4.3.5 Scenario 3: Switching to third party billing to hire one full time nurse practitioner, or one full time nurse practitioner and one full time physicians' assistant.

It is really complicated to analyze feasibly whether or not the Health Services at Worcester Polytechnic Institute will be able to generate enough revenue from implementing the services provided by third party billing to hire either one full time nurse practitioner, or one full time nurse practitioner and one full time physicians' assistant to the current medical staff. Therefore, our MQP group will instead analyze third party billing and determine if it will help

solve two important issues involving the Health Services at Worcester Polytechnic Institute. The first issue in regards to third party billing is to determine whether or not implementing third party billing services will help improve the financial situation that the director of the Health Services is currently facing. The second issue in regards with third party billing is to determine if it is structurally possible for the director to implement third party billing for the Health Services here at Worcester Polytechnic Institute.

Third party billing is a billing service that the Health Services at Worcester Polytechnic Institute could implement in order to generate more revenue while allowing the physicians to have more time on focusing on treating their patients instead of dealing with billing issues. A few ways third party billing companies could help the Health Services generate more revenue is by cutting down the costs of having a billing department, lowering the number of claim denials, and following up on the denied claims. Unfortunately, there might be a downside for the Health Services to implement third party billing as well since an article in The University of Maryland's newspaper that states that, "Students may also see higher prices for health center services as a result of the administrative costs associated with a third party billing system, such as costs for new staff to process check-ins and charges, bill insurance companies and perform other associated responsibilities."

When it comes to implementing third party billing, the director of the Health Services can choose to have the billing done by two different methods, either by in house or by out house. If the Health Services is going to choose in house billing, they would be required to select and purchase billing software, train the staff on how to use and perform billing software, and finally get the staff credentialed with the insurance companies. Out house billing on the other hand is less complicated than in house billing due to the fact that it will be an outside company that is

going to be performing all of the work and billing services for the Health Services. When it comes down to deciding which of the two different methods of third party billing is best to implement at the Health Services here at Worcester Polytechnic Institute, we would need to look at the strengths and weaknesses of each method in terms of costs. In house billing is going to require the Health Services to invest in a large sum of money in the early stages of implementation such as purchasing the billing software and in the final stages such as credentialing the staff but on the other hand, the Health Services would keep 100% of all of the revenue that is generated from implementing in house billing. Out house billing is going to require the Health Services to invest in far lesser amounts of money since no software is needed to be purchased or staff to be credentialed due to the fact that the outside billing company will already be equipped with these services but on the other hand, the Health Services is going to have lesser amounts of revenue generated since some of the revenue goes back to the outside billing company as a fee for their billing services. Determining the costs of implementing either of these two different methods of third party billing and the profits generated from it is difficult to analyze since there is a lot of variation between the costs of the many different outside billing companies, the size of student population at the college, the amount of staff at the Health Services, the number of claims processed, and the costs of the billing software and accreditation process.

After analyzing how the Health Services could or could not generate revenue from implementing third party billing, we now will do the opposite and analyze how third party billing companies generate revenue from providing their services to the Health Services. Third party billing companies use a method called "percentage based agreements," as a way to charge the Health Services a fee for their services. One percentage based agreement method is called the

"percentage of collections," where the third party billing company will charge the Health Services at Worcester Polytechnic Institute a certain percentage based on the profits collected from the claims submitted by the patients to their insurance companies. According to a marketing report written by Chris Thorman on softwareadvice.com, "The industry average is approximately a 7% charge for processing claims through a medical billing service." The third party billing company will only receive a fee for their service in cases where they had involvement when it comes to the collection of the claims. Under this percentage based agreement of percentage of collections, the third party billing company makes profit whenever the Health Services generates a profit.

One college that our MQP group researched in order to determine which of the two methods of third party billing is going to be better suited for the Health Services at Worcester Polytechnic Institute to implement was Western Kentucky University which had an enrolled student population of over 20,000. The Health Services at this university choose to implement in house billing which resulted in profits of $1,218,463.00 for the fiscal year 2010. In a report written by the director of the Health Services at Western Kentucky University in terms of choosing to have in house as opposed to out-house billing, Libby Greaney stated, "it was much more conducive to customer service issues in that our patients call us with any issues and we have more of a vested interest in assisting them versus a distant company."

During our interviews with directors of Health Services of nearby colleges, our MQP group noticed one recurring theme when asked about implanting third party billing at their Health Services. Our MQP group felt that this one recurring theme was a key factor on determining whether or not the Health Services at Worcester Polytechnic Institute would be structurally able to implement the third party billing. Half of the directors being interviewed felt

that third party billing could only be structurally implemented at Health Services where the college had a large number of enrolled students. Of the six colleges that our MQP had interviewed for research, the college that had the highest number of enrolled students (College B, over 6400 students) happened to be the only college on our list that implemented a third party billing for their Health Services. The college with the next highest number of enrolled students on our interviewed list was College D with an enrollment of over 4800 students. The director of Health Services at College D felt that it would be difficult to implement third party billing at college of their size. Our MQP group determined that in our best opinion, the larger the college, the more likely the Health Services of that college can structurally implement third party billing.

Since Worcester Polytechnic Institute only has a little over 3700 student enrolled for the 2011-2012 academic school year, our MQP group determines that in our best opinion, the director of the Health Services cannot structurally implement the third party billing. Our MQP group determined that if Worcester Polytechnic Institute had the same number of enroll students as College B (over 6400) or even higher, then third party billing can be implemented and that it can help the Health Services generate more revenue thus improving their financial situation.

4.4 Break-Even Analysis

The break-even analysis is another one of the four different methods of analysis that our MQP group is conducting that will best help us develop a new revenue structure plan that would help generate more revenue for the Health Services. Back in section 4.3, our MQP group analyzed several different scenarios to determine whether or not it was possible for the Health Services at Worcester Polytechnic Institute to add either one full time nurse practitioner or one full time nurse practitioner and one full time physicians' assistant to the staff. Our analysis came up with various numbers but with the use of the break-even analysis, our MQP group will be able

to calculate the break-even or exact point at which the Health Services would start generating enough revenue.

To calculate the break-even point for scenario 1A and 2A, our MQP group subtracted the amount of the increased student health fee that was calculated in section 4.3.1($80.00) and section 4.3.4($160.00), by $1.00, $2.00, and so on until we reached the exact point at where the increase in student health fees would generate just enough revenue to cover the costs of adding one full time nurse practitioner or one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff. To calculate the break-even point for scenario 1B and 2B, our MQP group subtracted the amount of the fee for service charge that was calculated in section 4.3.2($25.00) and section 4.3.5($45.00), by $1.00, $2.00, and so on until we reached the exact point at where the revenue generated by the fees for service would be able to cover the costs of adding one full time nurse practitioner or one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff. The break even points of each of the scenario analysis are shown in Table 11.

	Amount that the Student Health Fees have to be increased	**Break Even point of Increased Student Health Fees**	**Cost of Fees for Service**	**Break-even Point of Fees for Service**
Scenario 1A: Increasing Student Health Fees to add 1 Full Time Nurse Practitioner	$80.00	$77.58	-----	-----
Scenario 1B: Implementing Fees for Service	-----	-----	$25.00	$20.35

to add 1 Full Time Nurse Practitioner				
Scenario 2A: Increasing Student Health Fees to add 1 Full Time Nurse Practitioner and 1 Full Time Physicians' Assistant	$160.00	$155.16	-----	-----
Scenario 2B: Implementing Fees for Service to add 1 Full Time Nurse Practitioner and 1 Full Time Physicians' Assistant	-----	-----	$45.00	$40.70

Table 11: Break-Even table

In section 4.3.1, Scenario 1A, our MQP group determined that a student health fee increase of at least $80.00 was needed in order to cover the costs of adding one full time nurse practitioner to the Health Services' staff. Overall, students would then be charged a total student health fee of $400.00. The exact amount or "break-even point" that the student health fee would have to be increased in order for the Health Services at Worcester Polytechnic Institute to cover the costs of adding one full time nurse practitioner would be $77.58. The break-even total student health fee would then cost students $397.58.

In section 4.3.2, Scenario 1B, our MQP group determined that the fee for service charge which would only be charged to students that visited the Health Services, would need to be at least $25.00 in order to cover the costs of adding one full time nurse practitioner to the Health

Services' staff. The exact fee for service amount or "break-even point" that students who visit the Health Services would have to pay in order to cover the costs of adding one full time nurse practitioner to the Health Services would be $20.35.

In section 4.3.3, Scenario 2A, our MQP group determined that a student health fee increase of at least $160.00 was needed in order to cover the costs of adding one full time nurse practitioner or one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff. Overall, students would then be charged a total student health fee of $480.00. The exact amount or "break-even point" that the student health fee would have to be increased in order for the Health Services at Worcester Polytechnic Institute to cover the costs of adding one full time nurse practitioner or one full time nurse practitioner and one full time physicians' assistant would be $155.16. The break-even total student health fee would then cost students $475.16.

In section 4.3.4, Scenario 2B, our MQP group determined that the fee for service charge which would only be charged to students that visited the Health Services, would need to be at least $45.00 in order to cover the costs of adding one full time nurse practitioner or one full time nurse practitioner and one full time physicians' assistant to the Health Services' staff. The exact fee for service amount or "break-even point" that students who visit the Health Services would have to pay in order to cover the costs of adding two part time registered nurses to the Health Services would be $40.70.

Chapter 5: Conclusions and Recommendations

After careful consideration and analysis, we have composed some recommendations for implementation at WPI Health Services. There are several different paths that WPI Health Services could take and the recommendations can be found in order of preference as we see best

fit for the well-being of both the staff of WPI Health Services as well as the students that attend Worcester Polytechnic Institute.

The first recommendation is to petition to increase the percentage of funds that WPI Health Services receives from the student health fee from 39% to 44%. This 5% increase in budget would allow Health Services to hire one full-time nurse without any extra cost to the students. We realize that this may not be entirely possible and so we have gathered further recommendations for implementation.

In the case that our first recommendation is impossible, we would recommend raising the student health fee by $77.58 in order to hire one full-time nurse practitioner, or by $155.16 to hire both a full-time nurse practitioner and physicians' assistant. This is not ideal as it would be an extra cost to the students. However, this would theoretically in turn provide better quality services to the students in which case an increase in the student health fee would be warranted.

An alternative course of action that we recommend implementing would be a fee-for-service in addition to the current student health fee. A fee of at least $20.35 per appointment is needed to hire one full-time nurse practitioner. A fee of at least $40.70 per appointment is needed to hire both a full-time nurse practitioner and physicians' assistant. Although this situation is not ideal for the students, it would generate the revenue needed for the additional staff that WPI Health Services does in fact need.

We have decided not to include a recommendation to implement third-party billing. We have gathered that it is quite difficult to implement such a feature at a small college and essentially just not worth the effort. We first recommend an increase in the percentage of funds that Health Services receives from the student health fee. Alternatively we recommend an

increase in the student health fee, or lastly an addition of a fee-for-service. Each recommendation has its advantages and disadvantages, but we ultimately need to keep in mind the best interest of the WPI Health Services staff as well as the well-being of the students.

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Appendices

Appendix A: Interview Protocol

Introduction: Currently, colleges across the nation are facing problems regarding finding revenue for their Health Services. There has been discussion among the directors and administrative college officials as to how to deal with this problem. The best possible methods of generating revenue that have been discussed are implementing student health fees, fee for service, or even switching to third party billing.

1. What is your revenue stream structure? Tell us about how this works.
2. How many full-time students are enrolled at your University?
3. Who does your staff entail?
4. About how many students are seen each day?
5. Do you only serve full-time students or do you also serve graduate students/faculty?
6. What do you like about it?
7. What do you dislike about it? What issues are there?
8. Do you think that you receive sufficient funding to meet your needs with this structure?
9. Has this revenue structure always been implemented?
10. If no, why was it changed?
11. Is your medical equipment leased?
12. Where does your medical staff come from?
13. What the percentage of the budget goes to salary of the staff?
14. What are the financial benefits of your revenue stream model?
15. Are there any other revenue steam models that you have looked at or wanted to switch?

Appendix B: College A Interview Summary

1. How many full-time students are enrolled at your University?
    a. 2200 undergraduates
2. Who does your staff entail?
    a. Entire staff is part time.
    b. 2 sectaries
    c. 2 nurses
    d. 2 nurse practitioners
    e. 1 half time physician (only one physician per day on site, a total 4 physicians that work a total of 20 hours a week combined, each physician works only one day a week)
3. About how many students are seen each day?
    a. 3800 a school year. Doesn't have the numbers for each day off the top of her head.
4. Do you only serve full-time students or do you also serve graduate students/faculty?
    a. Serve graduate students.
    b. Do not serve faculty or family
    c. Part time students as well
5. What is your revenue stream structure? Tell us about how this works.
    a. Year to year contract with Umass.
    b. All medical staff at Health Services are Umass employees.
    c. No student health fees (hidden inside student's tuition bill)
    d. Undergrads do not need to pay fees for service
    e. Grad students have to pay fees for service

f. Students need health insurance. American born students can sign waivers but international students cannot. International students have to purchase school health insurance plan.

g. Health Services are on a break even budget

h. 95% of the health service budget goes to pay the staff.

i. Limited budget. Cannot hire anymore staff.

j. President is thinking of charging undergrad students fees for service while having a contract with Umass to generate more revenue.

k. The university pays for overhead, telephone bills, cleaning bills, and computers.

l. Students have to find their own ride to hospitals.

m. Counseling services, lab, and blood work all housed in one building.

n. Contract is year to year so if the university decides to switch to another plan, the current health service staff no longer works at the university.

o. Health insurance plan covers the cost of administering vaccine shots.

6. What do you like about it?
7. What do you dislike about it? What issues are there?
8. Do you think that you receive sufficient funding to meet your needs with this structure?
    a. No.
9. Has this revenue structure always been implemented?
    a. No, health services had a contract with Hamon before switching to Umass
10. If no, why was it changed?
    a. President's choice to cut costs.

Appendix C: College B Interview Summary

1. How many full-time students are enrolled at your University?
    a. 6409 undergrads, 749 grad students
2. Who does your staff entail?
    a. 1 Assistant director – full time 12 months
    b. 2 nurse practitioners – full time 9 months
    c. 1 Woman Health Practitioner – 24 hours a week 9 months
    d. 3 or 4 nurse practitioners – one per day
    e. 2 medical assistants – full time 9 months
    f. 1 Registered nurse- full time 10 months
    g. 1 Registered nurse- full time 9 months
    h. 3 sectaries – 12 months
    i. 1 sectary – 9 months
3. Where does your staff come from?
    a. They are either benefited employees or per diem employees. Our doctor is a contracted employee.
4. About how many students are seen each day?
    a. 5100 students seen last year
5. Do you only serve full-time students or do you also serve graduate students/faculty?
    a. Serve all students who pay the health fee.
    b. No faculty and staff.
6. What is your revenue stream structure? Tell us about how this works.
    a. Combination of student health fees and third party billing
    b. First health service to implement third party billing

c. Third party billing company was once called Highland group, now is called Viviture

d. Vivture takes a percentage of the revenues during the first year of implementation

e. Student health fees are $47.50 per semester. (Two semesters)

f. Viviture trains the health service staff (sectaries) on coding needed for billing

g. Sectaries take on more work

h. Over 60% of the health service budget goes to paying the salaries.

7. What do you like about it?
    a. Revenue from third party billing pays for the salaries
    b. Highly recommends third party billing
8. What do you dislike about it? What issues are there?
    a. None
9. Do you think that you receive sufficient funding to meet your needs with this structure?
    a. Yes thanks in large part to third party billing
10. What is the financial benefit of third party billing at this university?
    a. It helps cover salaries
11. What percentage of the health services' budget comes from third party billing?
    a. 11% student health fees?
    b. 77% carryover from FY 2012 12%
12. Has this revenue structure always been implemented?
    a. No, started third party billing after 2007
    b. Before 2007, revenue came from student health fees
13. If no, why was it changed?

a. Costs of salaries and benefits were going up
b. Revenue was needed to pay for the expansion of the health service building

14. Do you lease medical equipment here?
    a. No
15. Do you operate on a break-even budget?
    a. We try to. If there is a surplus we have been allowed to keep it in the past.
16. Did you encounter any surplus in your budget? If so, did it go back to the school or does it stay in your budget?
    a. We did have a surplus last year, but we were allowed to keep it to prevent a deficit for this year.
17. What type of services does the health service provide to the students?
    a. Immunizations, lab (CLIA waived done in-house, other lab obtained and sent to our reference lab UMass Memorial), medical care, care for basic injury (no suturing or x-ray on-site), health education programming, Women's Health Nurse Practioner (No colposcopy or IUD insertions).

Other notes:

Health service is open 5 days a week. There was a deficit before 2003. No specialty services offered at health service. Student health fees have not been raised in the last 8-10 years. Health service center not connected to counseling center. Health service is located 6 minutes from hospital. Health services is more like a doctor's office. Health service provides basic services, no x-rays.

Appendix D: College C Interview Summary

1. How many full-time students are enrolled at your University?
    a. 1200 students
2. Who does your staff entail?
    a. 1 nurse practitioner
    b. 1 physician – only works in the morning
    c. 1 full time counselor
3. About how many students are seen each day?
    a. 20-30 per day
4. Do you only serve full-time students or do you also serve graduate students/faculty?
    a. Serve undergrads
    b. No faculty and staff.
5. What is your revenue stream structure? Tell us about how this works.
    a. No student health fees
    b. Students are charged an undisclosed amount that is hidden in their tuition bill
    c. Health Service budget comes from the students tuition bill
6. What do you like about it?
    a. nothing
7. What do you dislike about it? What issues are there?
    a. Not enough staff
    b. Cannot add any more staff due to not having any revenue
8. Do you think that you receive sufficient funding to meet your needs with this structure?
    a. no
9. Has this revenue structure always been implemented?

a. yes

10. If no, why was it changed?

Other notes:

Director feels that the college is not a big enough college for third party billing.

Director/nurse practitioner sees about 20-30 students a day at the health service. There is a counseling center within the health service.

Appendix E: College D Interview Summary

1. How many full-time students are enrolled at your University?
    a. 4800 undergrads, 1500-1800 grad students
2. Who does your staff entail?
    a. 4 physicians (3 are full time)
    b. 5 mid-level physician assistants/nurse practitioner
    c. 4 nurses
    d. 3 medical assistants
    e. 3 lab workers
    f. 7 or 8 staffers doing office work
    g. 3 psychiatrists
3. About how many students are seen each day?
4. Do you only serve full-time students or do you also serve graduate students/faculty?
    a. Serve undergrad and grad students.
    b. No faculty and staff.
5. What is your revenue stream structure? Tell us about how this works.
    a. 80% of health service budget comes from revenue of the student health fees
    b. The rest comes from lab work as well as some of the specialty services such as the orthopedist and psychiatrist which is billed to the students' insurance company
    c. $650 a year for student health fees. (Director believes this is a sufficient amount)
    d. 70% of budget goes to pay staff
    e. Director Bowdler tries to stay within the budget to make the best decisions, keeping the student's best interest in mind
6. What do you like about it?

a. Good setup, nice building

b. She is responsible for her budget and can make decisions at her discretion

7. What do you dislike about it? What issues are there?

    a. Little to nothing. The only thing is there are some things that she has no control over such as the number of students admitted each year.

8. Do you think that you receive sufficient funding to meet your needs with this structure?

    a. Absolutely.

9. Has this revenue structure always been implemented?

    a. Yes, for the last 15 years since she has been the director.

10. If no, why was it changed?

11. Do you lease medical equipment here?

    a. We purchase most of it

12. Where does your staff come from?

    a. College health, other medical positions around Boston -- family practice, internal medicine

13. Did you encounter any surplus in your budget? If so, did it go back to the school or does it stay in your budget?

    a. Any money would go back to the school but right now, we just about cover our expenses and do not return money to the school

14. What type of services does the health service provide to the students?

    a. Look on website for that info

Other notes:

Health Services is open 6 days a week until 6pm, until 8pm one day a week. Hours have been cut. Lab, testing, and counseling services are offered on site. Some testing is sent to Quest. Students can either schedule appointments or walk-ins. No longer have dermatologist (too busy). No longer have gynecologists (not busy at all). Massage therapist charges per hour. Chiropractor accepts health insurance, no copay. Orthopedist comes in once a week. Counseling center is always busy. Students want a lot of services. There is a prescription center in the Health Service that is operated by a private pharmacist who bills the insurance company. Will call an ambulance for the student, does not want students to travel by taxi or friends car to hospital. Director believes the ambulance is best equipped and prepared to handle student on the way to the hospital. Inside of health service looked like a hospital along with intercoms. Health service is located in the western corner of the campus between two frat houses but director believes the students have no trouble finding or traveling to it. Offers travel medicine and information for students traveling outside the country.

*The director believes that third party billing is a mess. It's hard to accomplish third party billing at small colleges. Not all students are alike when it comes to medical needs. Director performed a lot of cost saving maneuvers once she arrived at Health Service. Something that should be kept in consideration is whether or not many students are still seeing their home provider. If many students are, upgrading health services would not be manageable. Also, every school is different and so revenue structures really need to be considered on a case to case basis.

Appendix F: College E Interview Summary

1. How many full-time students are enrolled at your College?
    a. Roughly 3,500
2. Who does your staff entail?
    a. One full-time nurse practitioner
        i. Also the director
    b. Two part-time nurse practitioners
    c. One full-time administrative assistant
    d. One full-time clerical assistant
3. About how many students are seen each day?
    a. Last academic year saw roughly 2,000 students.
4. Do you only serve full-time students or do you also serve graduate students/faculty?
    a. Only see undergraduate students. Either full-time or part-time.
5. What is your revenue stream structure? Tell us about how this works.
    a. Students pay a student health fee of $42.5 dollars a semester, or $80 a year for unlimited access to health services. Part-time students pay $3.40 per credit hour, so a student taking a three credit course would pay about $11.
6. What do you like about it?
    a. Good campus image. They attend all orientations, reach out to commuter students, have a lot of repeat students, collaborate with various on-campus departments, and go into classrooms and club meetings to discuss what health services offers.
7. What do you dislike about it? What issues are there?
    a. No major dislikes, but looking into a future of potential third party billing.

8. Do you think that you receive sufficient funding to meet your needs with this structure?
    a. They break-even for the most part, but when they have a surplus it goes into a health services trust fund for future purchasing.
9. Has this revenue structure always been implemented?
    a. A contract has been in place for the past 15 years.
10. If no, why was it changed?
    a. There was one only nurse working for the whole school.
11. Are there any other services you would like to see?
    a. They are trying to get a nutritionist to come in, as well as a psychiatrist.
12. Do you send out surveys on student satisfaction?
    a. They give surveys for visiting patients to fill out, but see minimal returns on those. They are looking to use the American College Health Association Survey for the general student body.

Appendix G: College F Interview Summary

1. How many full-time students are enrolled at your University?
    a. 2,728 students
2. Who does your staff entail?
    a. 2 current nurse practitioners (30hrs for 40 weeks per year)
        i. One is also the director
        ii. Hiring a third soon because an RN left
    b. 2 registered nurses (40hrs for 42 weeks per year)
        i. One is a clinical coordinator (40hrs for 48 weeks per year)
    c. 2 physicians (20hrs between both per week)
        1 administrative assistant (40hrs a week, year round)
3. About how many students were seen last year?
    a. 4,499 students
4. Do you only serve full-time students or do you also serve graduate students/faculty?
    a. Serve undergraduates
    b. No graduate students
    c. Only see faculty for faculty related injuries, not physicals and other services.
5. What is your revenue stream structure? Tell us about how this works.
    a. Student Health fee within students tuition - $284 per year
    b. Health Service budget comes from the students tuition bill
    c. Separate line for employee salary, travel expenses, supplies, and equipment
6. What do you like about it?
    a. Everything.

7. What do you dislike about it? What issues are there?
    a. Nothing.
8. Do you think that you receive sufficient funding to meet your needs with this structure?
    a. Yes.
9. Has this revenue structure always been implemented?
    a. As long as the director has been there.
10. If no, why was it changed?

Other notes:

- College F constantly accredits their workers every three years, which can cost $6,000. The director would like to save the surplus from what they do not spend on equipment and other needs.
- Director has done third party billing benchmarks and would potentially like to implement third party billing in the future.
- College F sends out surveys after patients visit and to the general population, but does not see much response.
- Their medical equipment is purchased, not rented.
- UMASS workers.